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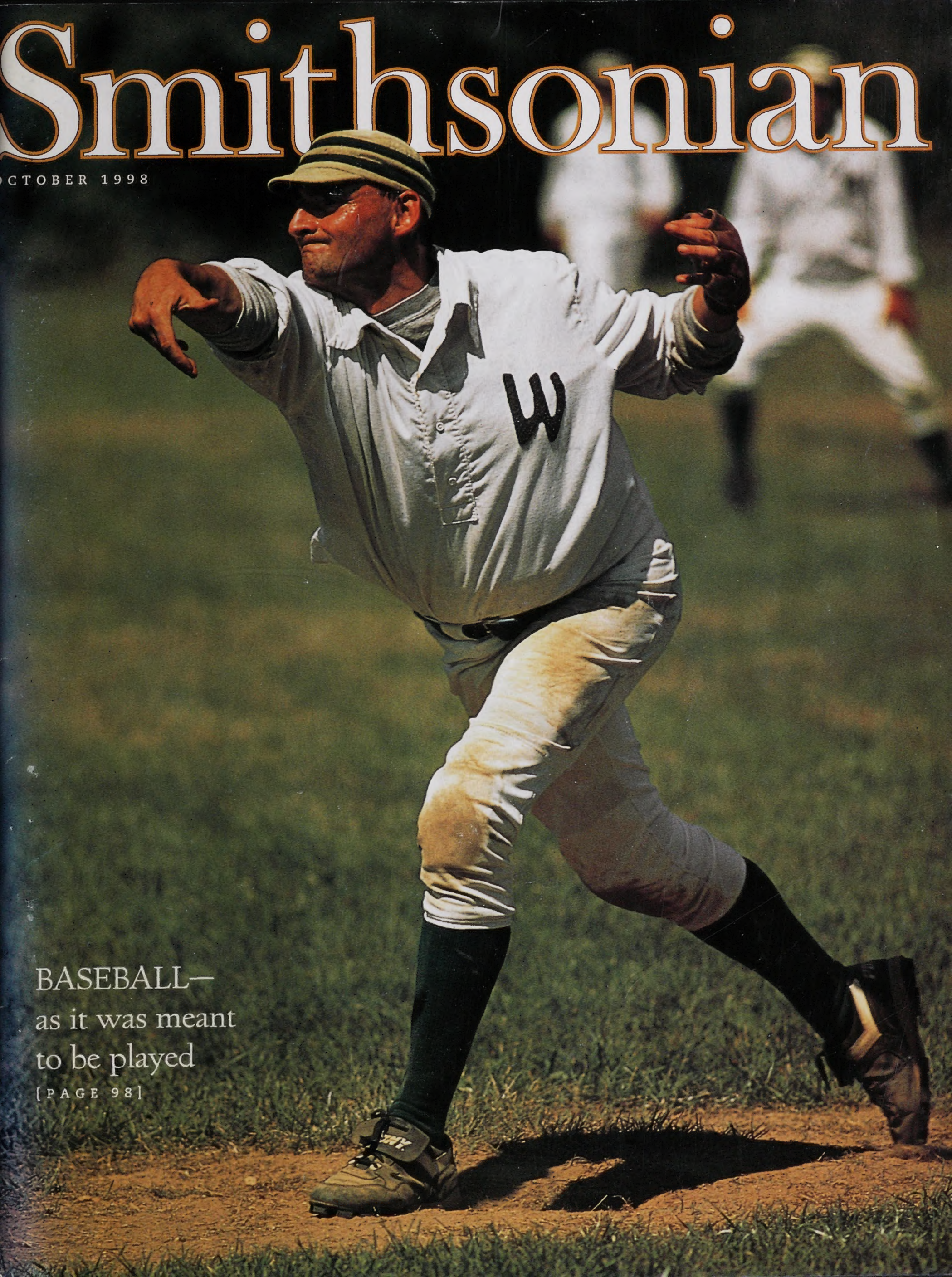

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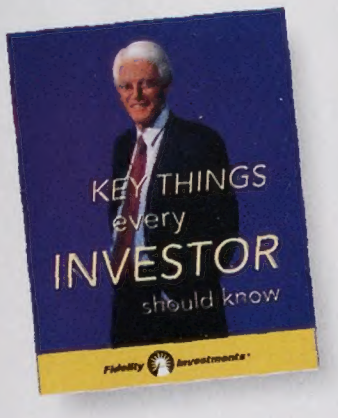

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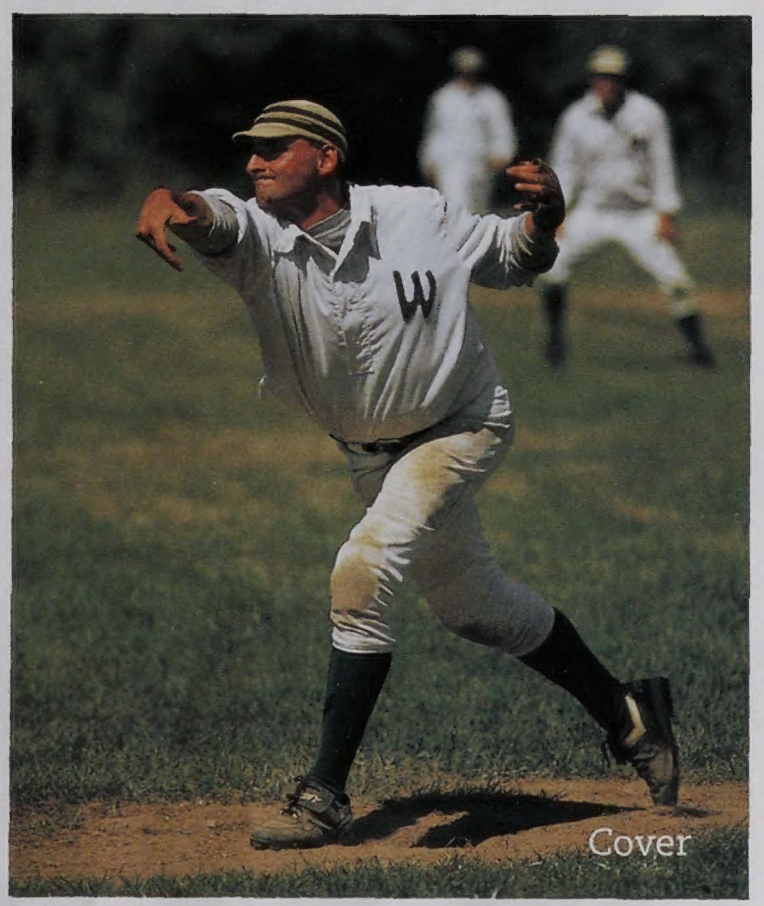

Cover Cliff "Buck" Archer of the Westburys demonstrates his pitching form in a baseball game played by 1887 rules at Hewlett Field, Old Bethpage Village Restoration, Old Bethpage, New York. Archer also plays modern hardball in an adult league.
PHOTOGRAPH BY DOUGLAS MERRIAM

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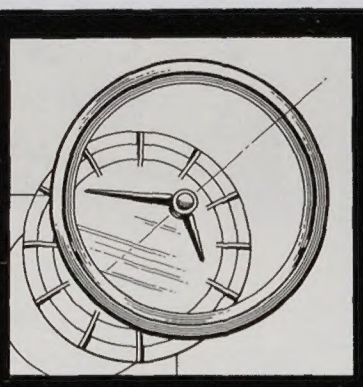

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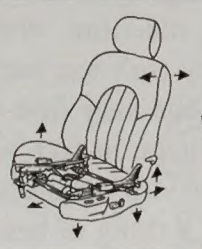

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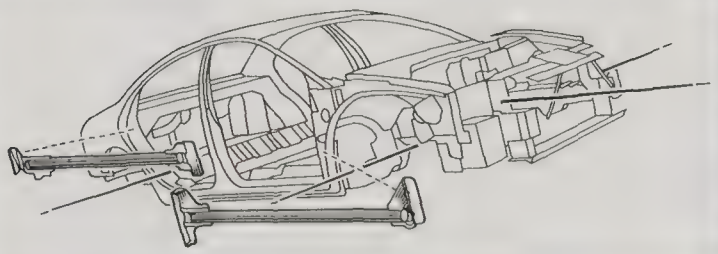

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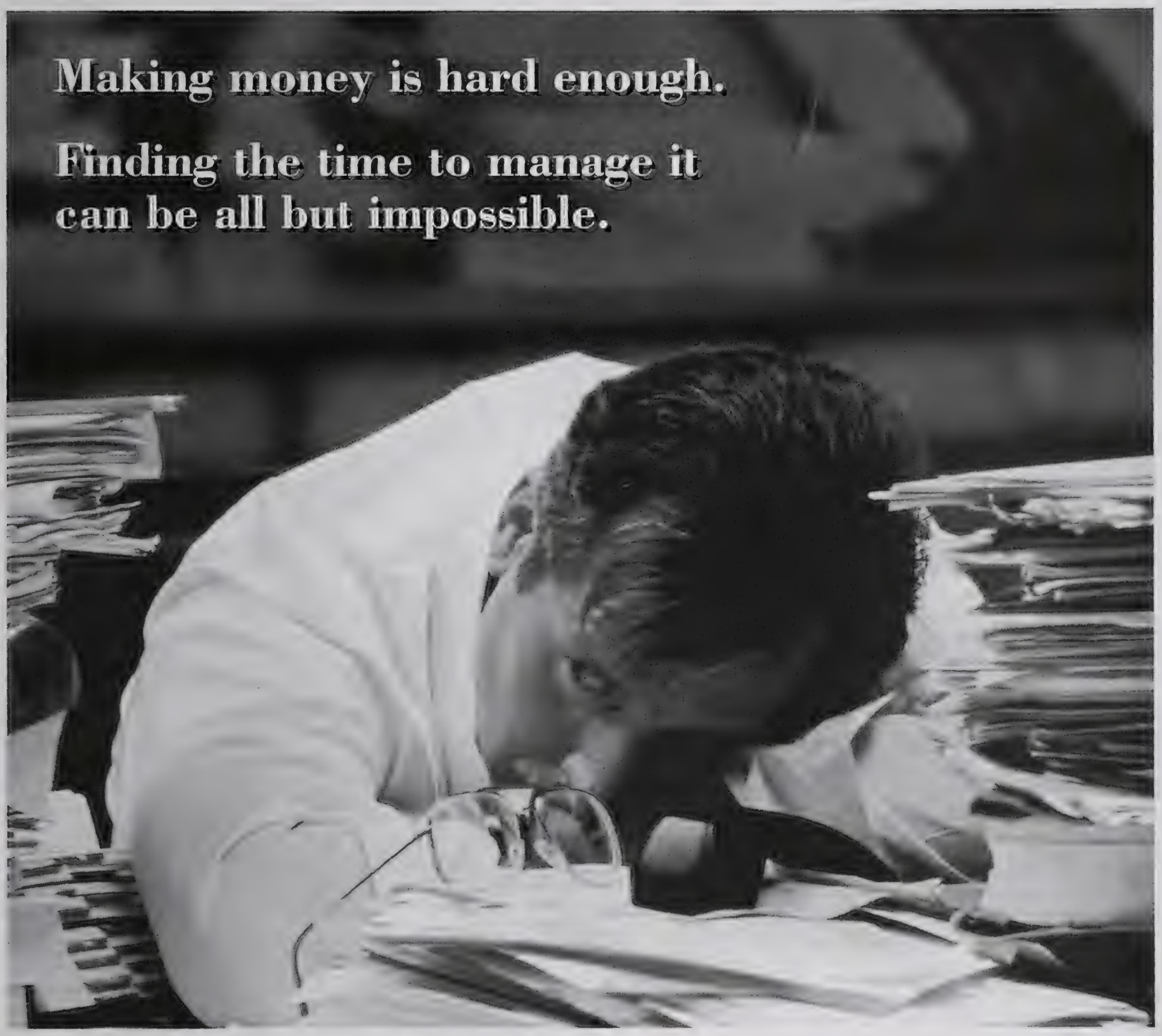

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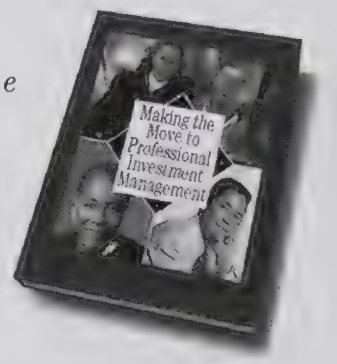

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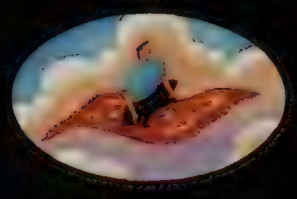

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SMITHSONIAN

PERSPECTIVES

Dispatches from the Past

AN EXHIBITION AT THE POSTAL MUSEUM COMMEMORATES THE CENTENNIAL OF THE KLONDIKE/ALASKA GOLD RUSH

EVERY OBJECT TELLS A STORY. EVEN THE MOST ORDINARY objects possess the ability to evoke powerful images, memories and emotions. Sometimes it is the ordinary nature of these objects that actually makes them so extraordinary. Such is the case with an old leather shoe at the National Postal Museum. At first glance it does not look like much. It is a timeworn remnant of once-fashionable footwear, the tattered, sole survivor of a pair owned by a woman in the 1890s. Perhaps discarded then without a thought, the shoe is not dismissed so lightly now. Instead, this lowly shoe, on loan to the museum from the National Park Service, is part of a new exhibition commemorating the centennial of the Klondike/Alaska gold rush. "As Precious as Gold," which opens October 7 and continues through September 30, 2000, explores the events of a century ago when more than 100,000 would-be millionaires set out for a faraway place known as the Klondike.

Few of those stricken with "gold fever" realized the enormity of their pursuit. Indeed, the stampeders' bravado often turned to despair when they came face-to-face with the forbidding Coast Mountains bordering Canada and Alaska, and the realization that the goldfields still lay more than 500 miles beyond.

Some of the early gold rushers, ill-prepared for their dangerous odyssey, died of starvation. In response, Canadian authorities required prospectors crossing into Canada to bring one ton of supplies with them. This was estimated to be one year's worth of survival rations, including a tent, stove and cooking utensils, blankets, medical supplies, warm clothing and plenty of food.

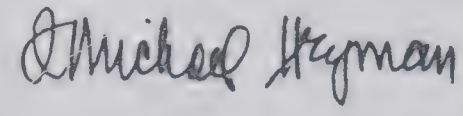
The most famous trail into the goldfields was over the Chilkoot Pass. A particularly infamous portion of the trail—known as the Golden Stairs—appeared so forbidding that many simply turned back. To reach the Chilkoot Pass summit required climbing 1,500 stairs chopped out of the ice. It was necessary to repeat the trip as many as 40 times, as prospectors carried their ton of provisions on their backs in 50-pound packs. The slow, rhythmic "chorus line" of climbers up the icy staircase became known as the Chilkoot lockstep.

The discarded leather shoe, found along the Chilkoot Pass, symbolizes the determination of the stampeders in general, but it also causes us to reflect on its nameless owner and the possible fate of countless others like her. Perhaps the owner turned back before taking all her supplies to the summit. Perhaps she successfully scaled the summit and later went on to settle in Fairbanks or Nome, becoming an Alaskan. All we do know for certain is that she braved the unknown, risking everything in one of the grandest adventures of the 19th century.

Other artifacts in this exhibition—including letters, an Alaska mail dogsled and a postal inspector's retirement locket—speak to us about the efforts of the postal system to bind a nation that was moving into the territories faster than the mails could keep up with it. Few mail routes served the ever-growing and ever-moving population that swarmed into the Alaska Territory. In 1898, the postal service appointed John Clum as the postal inspector for the territory. Prior to his appointment, it typically took three frustrating years to find and appoint a postmaster in Alaska. By the time the candidate's official appointment arrived, wrote Clum, "the new postmaster would have been eaten up by bears, died of old age or scurvy, or have left the country."

Clum traveled more than 8,000 miles establishing dozens of post offices and mail routes, and appointing postmasters. The diamond-studded gold-and-enamel locket Clum received when he retired from the postal service in 1906 is included in the exhibition.

The objects in the exhibition are vivid reminders of the dreams, ambitions, accomplishments and failures of those who participated in the gold rush. They also tell us about the essential lifeline provided them by mail, America's first information superhighway. The mail was their link to families and friends left behind. This sentiment was repeated frequently in the letters from the goldfields, including one written by Henry Wilkins to his wife, Wilhelmina, in West Albany, New York, January 8, 1899: "I must tell you that your letter . . . seemed to me as though I had got a fortune—it was so welcome." Such letters, and that long-abandoned shoe, are priceless testaments to our past.



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THE ART OF MONEY

IN HIS ARTICLE "THE ART OF MONEY," which appeared in the August issue, David Standish stated that the design of a country's paper currency reveals what is important to it. The £5 note issued in Scotland depicts the poet Robert Burns on one side and a tribute to his "Ode to a Mouse" on the other [detail, below]. It is a lovely expression of Scottish poetic values.

John Vye
Seattle, Washington

ON PAGE 112 YOU SHOWED THE FRONT of an Australian $10 bill that honors the Australian poet A. B. "Banjo" Paterson (1864-1941). That's not just any galloping cowboy "flicking a whip at a group of wild horses," mate. It's the man from Snowy River from Paterson's poem of the same name. The first lines of the much-loved poem ("There was a movement at the station, / For the word had got around / That the colt from old Regret had got away") are printed beneath Paterson's profile.

The poem was the basis for the 1982 adventure film *The Man from Snowy River*, starring veteran actor Kirk Douglas.

John Giovanelli
Kensington, Maryland

THE NEW CURRENCY OF THE 15-NATION European Union, which begins its three-year phase-in process in January 1999, will replace the national currencies of 11 member states. Debates over the euro's design and appearance have carried all the cultural weight that Standish outlined.

Valerie Staats
European Community Studies Assoc.
University of Pittsburgh
Pittsburgh, Pennsylvania

THE LOVELIEST PIECE OF CURRENCY I have ever come across was Hungary's 1,000-forint note. On it, a mother breast-feeding her baby is depicted. What a statement about what their culture values.

Kathryn Merrick
Choteau, Montana

LAST PAGE

IT WAS IMPOSSIBLE FOR ME NOT TO empathize with the plight of Alison Powers who described her vacation in "Hell on Wheels." What she had optimistically envisioned as a pleasant bicycle skim through the lush French countryside turned out instead to be a grueling test of physiological and psychological endurance.

Philosopher and writer George Santayana called bodily exercise "a modern superstition, invented by people who ate too much, and had nothing to think about."

William Dauenhauer
Wickliffe, Ohio

SMITHSONIAN HIGHLIGHTS

I AM SURPRISED THAT SCOTT CHINERY considered, even for a moment, commissioning master luthiers to craft purple or red archtop guitars to honor the centennial of the archtop. For anyone who knows the Wallace Stevens poem *The Man with the Blue Guitar*, there was but one choice: "They said, 'You have a blue guitar, / You do not play things as they are.' / The man replied, 'Things as they are / Are changed upon the blue guitar.'"

Mary W. Cox
North Miami, Florida

BACK PAIN

I HAD JUST SAT DOWN FOR WHAT I thought would be a quiet, relaxing lunch at my kitchen table, when I came across Richard Wolkomir's article about back pain. His words moved me: by the time I finished reading the article, I had stretched while sitting, stood up and leaned over the table, touched my toes a few times and leaned side to side. I am sure that Mr. Wolkomir got a lot of other readers moving, too.

Diane Neff Vance
Carmel, Indiana

I LOOKED IN VAIN FOR ANY MENTION in your article of chiropractic medicine. Three years ago I injured my back on the job. A doctor gave me a prescription for painkillers and some back exercises. The pain never went away completely, and after a few months, it flared up. The doctor next prescribed physical therapy three times a week and more painkillers. A few more months went by and the problem came back with greater intensity. The same doctor prescribed bed rest for a week. When that didn't help, she sent me to an orthopedic surgeon. He had me bend a few times, talked to me for a few minutes and gave me more exercises.

After more months of alternating discomfort and excruciating back spasms, a friend at work referred me to her chiropractor. I went to him and finally found relief through a regimen of spinal adjustment, acupuncture and effective exercise. The acupuncture provided more pain relief than the drugs ever did. Of course, as with any physician, it's very important to find someone who

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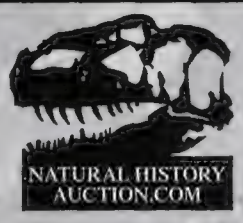

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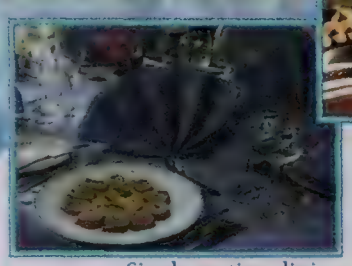
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The moral of this story is: don't knock it (or ignore it, as your article did) until you've tried it.

Nancy Elaine Fauser
Wilmington, North Carolina

HOW THE BARD WON THE WEST

WHAT A STORY! MANY, MANY THANKS to writer Jennifer Lee Carrell and illustrator Tim Raglin for a delicious and wild ride. You have brought Shakespeare alive for me in the context of the bragging, brawling, boasting and bewitching time of legends and myths that have become one of our greatest national treasures: the frontier days of the American West.

David S. Easton
Osage Beach, Missouri

I AM THE GREAT-GRANDNEPHEW OF mountain man Jim Bridger, and I am delighted to see the literate side of Ole Jim emerge once again. Ms. Carrell did a marvelous job of presenting the impact of William Shakespeare on the Old West.

Dale Wasserman, who wrote the musical drama *Man of La Mancha,* also penned the musical *Shakespeare and the Indians.* The latter was based on Jim Bridger's love affair with the work of the Bard.

Bobby Bridger
Austin, Texas

HOBOES

THANK YOU FOR THE ARTICLE ABOUT hoboes by James R. Chiles. Before the Depression, my father worked in the accounting department of the Richmond, Fredericksburg, and Potomac Railroad. At some point, business was down and my father, one of the newest employees, was let go. The RF&P was not heartless, however, and offered him a job as a fireman on one of their steam engines. One day as the train rounded a curve, the engineer explained to my father that when the engineer gave the signal, he should start shoveling coal out the

open door. My father thought it was odd, but did it. He was surprised to see a large number of hoboes rushing up from the trees to pick up the lumps of coal for their fires.

Eventually, even the fireman's job was lost by my father, but he never became a hobo.

Mark Rodeffer
Lovettsville, Virginia

THE ARTICLE ON HOBOES BROUGHT ME back to my days as a telegrapher for the Southern Pacific Railroad in the 1940s and 1950s. Riding the rods was truly a dangerous practice.

One incident in California bore this out. A freight train that was being pulled by one of Southern Pacific's cab-forward engines stopped at Tehachapi, and I was told to call an ambulance. It seems a hobo had been riding the "blind" (an open spot between the locomotive's smoke box and the tender) through several tunnels from Bakersfield. The heat built up in the tunnels and burned off most of his clothes. The poor soul died the next day at the hospital.

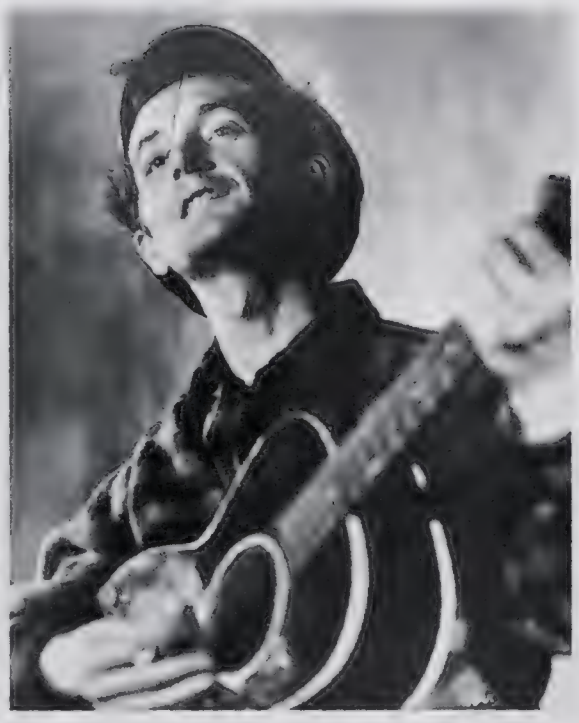
Richard W. Marshall
Wahiawa, Hawaii

MY MOTHER ALLOWED THE HOBOES who stopped by our home to sit at her fine kitchen table. One man refused to enter the house and had his plate served to him on our back stoop. Another man told me, "Shut your trap and quit starin' at me or I'll turn ya into a football."

Delores Martin-Ellis
Boone, North Carolina

JUDGING BY THEIR UNIFORMS AND emblems, two of the three men in the picture on page 73, who are dragging hoboes out of a boxcar, are U.S. Border Patrol agents, not "bulls." They are doing what we do today: apprehending those who do not belong.

HarryJames Ruffel
U.S. Border Patrol Academy
Glynco, Georgia



I'VE NEVER HAD THE NERVE TO HOP A freight, but it's always been a private fantasy. So I particularly appreciated your all-encompassing account, which provided some of the dangers, thrills and cultural stereotypes about hoboes.

One of this nation's most famous bums, Woody Guthrie [in the picture above], rode the rails during the Depression. In song and autobiography, he wrote quite eloquently about his hobo days. In the opening passage from his memoir, *Bound for Glory*, he wrote: "I could see men of all colors bouncing along in the box car. We stood up. We laid down. We piled around on each other. We used each other for pillows . . . About all I could hear above the raving and cussing and the roar of the car was the jingle and clink on the other side every time the wheels went over a rail joint. I guess ten or fifteen of us guys was singing: This train don't carry no gamblers, / Liars, thieves and big-shot ramblers; / This train is bound for glory, / This train."

Bruce Watson
Leverett, Massachusetts

MY GRANDFATHER CAME FROM SHEFfield, England, to Nova Scotia and eventually down to the United States, where he settled in the Springfield, Illinois, area. Prior to marrying my grandmother, he spent a lot of his time riding the rails. I was enthralled by his stories. My most cherished gift was the "hobo card" that he carried with him for about 70 years. The card was issued by the Hoboes of America and certified that he was a "Knight of the Road."

My grandfather always told me that "a tramp never worked for his food, a bum would work if he had to, but a hobo always did a job in return for his food."

Julie Ellin
Kent, Washington

SPONGES

HENRY GENTHE DESCRIBED A SPONGE race among ten sponge species. The "laboratory speedster" was the lavender *Haliclona loosanoffi*. Was this sponge named after Dr. Victor Loosanoff? I ask because he was a childhood friend of my mother and was saved from death by my father during the Russian Revolution.

Alex Shaw
Pagosa Springs, Colorado

Dr. Willard D. Hartman named the sponge after Dr. Victor Loosanoff in 1958. Ed.

JACQUES-LOUIS DAVID

I VERY MUCH ENJOYED THE ARTICLE BY Elizabeth Barkley Wilson about the artist Jacques-Louis David and the lovely plates you included, especially that of *Oath of the Horatii*.

The article stated that Lucius Brutus had his "sons executed for plotting to restore the emperor." The consul's sons had conspired to restore the ousted Etruscan king, Tarquin the Proud. The event took place almost five centuries before there was a Roman emperor.

Richard D. Weigel, Head
Department of History
Western Kentucky University
Bowling Green, Kentucky

Send mail to LettersEd@simag.si.edu or to Smithsonian Letters Editor, P.O. Box 44400, Washington, DC 20026-4400. Letters may be edited for clarity and length.

JOHN SPRINGER/CORBIS-BETTMANN

Wiring the Jersey Coast

IN ONE SPOT ON THE CONTINENTAL SHELF, SCIENTISTS AIM TO UNDERSTAND ALL THAT HAPPENS, 24 HOURS A DAY

BY JOHN P. WILEY, JR.

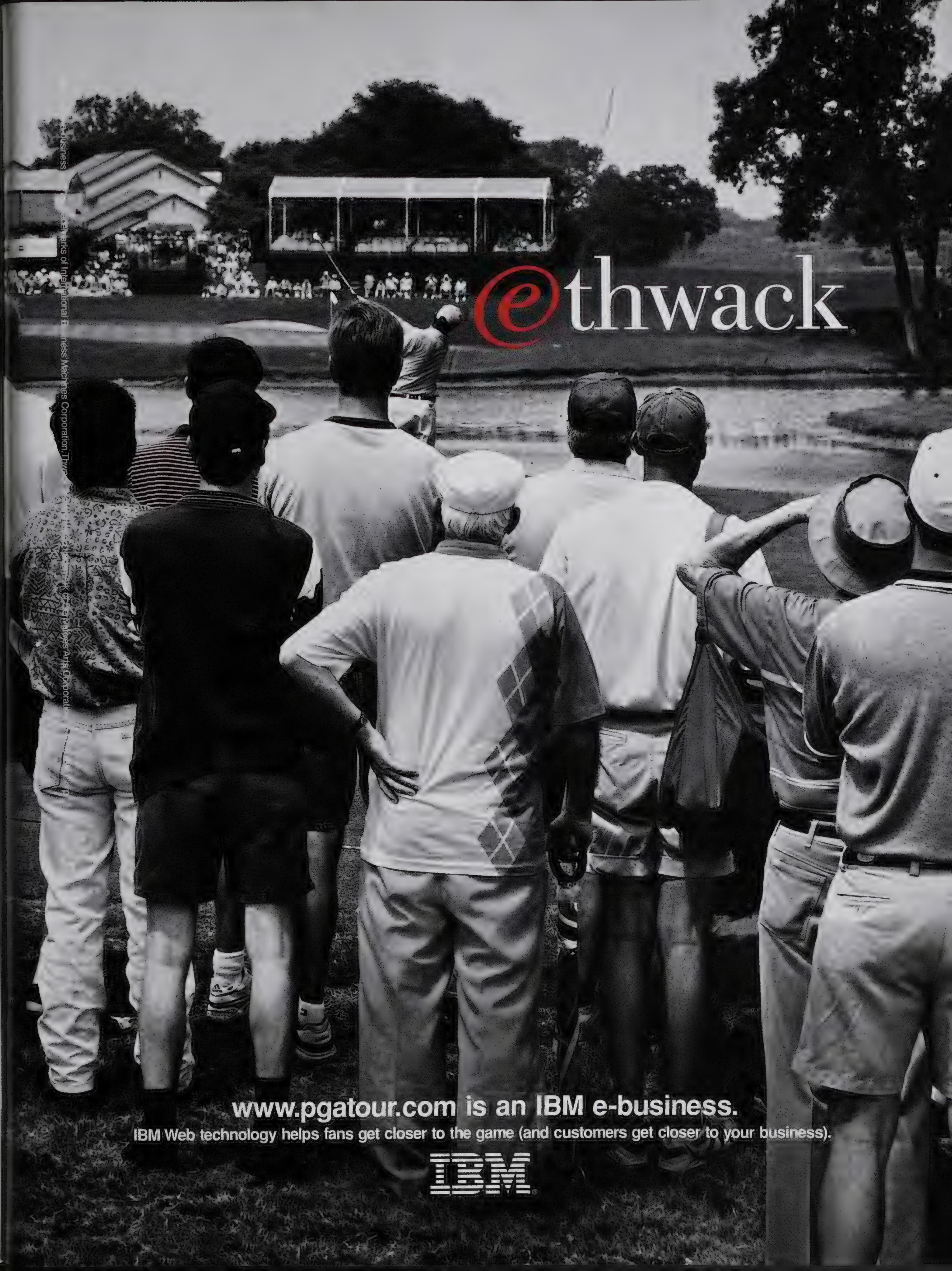
Before setting it loose in the open ocean, a team of scientists and engineers makes sure a torpedo-like underwater research vehicle doesn't leak. Instruments attached to it measure currents.

WE ARE FIVE MILES OFF the New Jersey beaches—although the water is only 50 feet deep—the twin outboard motors idling as our boat rolls in the swell. Somewhere beneath us a cluster of scientific instruments takes continual measurements of what is happening on the bottom, sending the information through a buried fiber-optic cable to a computer room in an old Coast Guard station. Also down there, in water so turbid that visibility is only three to four feet, is a docking cone for what looks like a small torpedo; the vehicle is packed with more scientific instruments and can roam 12 miles farther out to sea and back, taking measurements all the way.

The idea is that the "torpedo" will move into the docking cone like a shuttle rendezvousing with the *Mir* space station, except that acoustic signals are used to align torpedo and cone. Once docked, the vehicle will disgorge all its data ashore via the same cable, then recharge its batteries before setting off again. Aboard a 24-foot Zodiac known as the *Minnow*, we learn by radio from the shore station where the vehicle is and what it is doing. This day it is having trouble: it does not get far enough away from the cone to give itself enough time to line up when it heads for the cone again, and it keeps straying off to the south of the proper alignment. It corrects as it approaches, but never quite enough.

Roger Stokey, an engineer from the Woods Hole Oceanographic Institution in Massachusetts, talks by radio to the graduate student ashore whose program the torpedo will be using today. At one point they give up for the moment and bring the torpedo to the surface with an acoustic signal. Stokey and a colleague swing it into the boat and plug a modem into it; a thick black cable receives a new program over the *Minnow's* radio modem and loads it into the torpedo's computers. The white-and-yellow vehicle is then swung back into the water; a propeller on its tail spins, and it drives off and disappears. Alas, the vehicle still has trouble lining up with the cone, and finally we send five pings, it surfaces, and we scoop it up and head for home.

The instrument package on the bottom, known as Node A, lies southeast of Tuckerton, offshore from Great Bay, the estuary at the mouth of the Mullica River, which in turn brings exceptionally unpolluted water from the New Jersey Pinelands National Reserve. A second scientific station lies farther out at Node B; extending out from Node B is a line of six buoys that convert acoustic signals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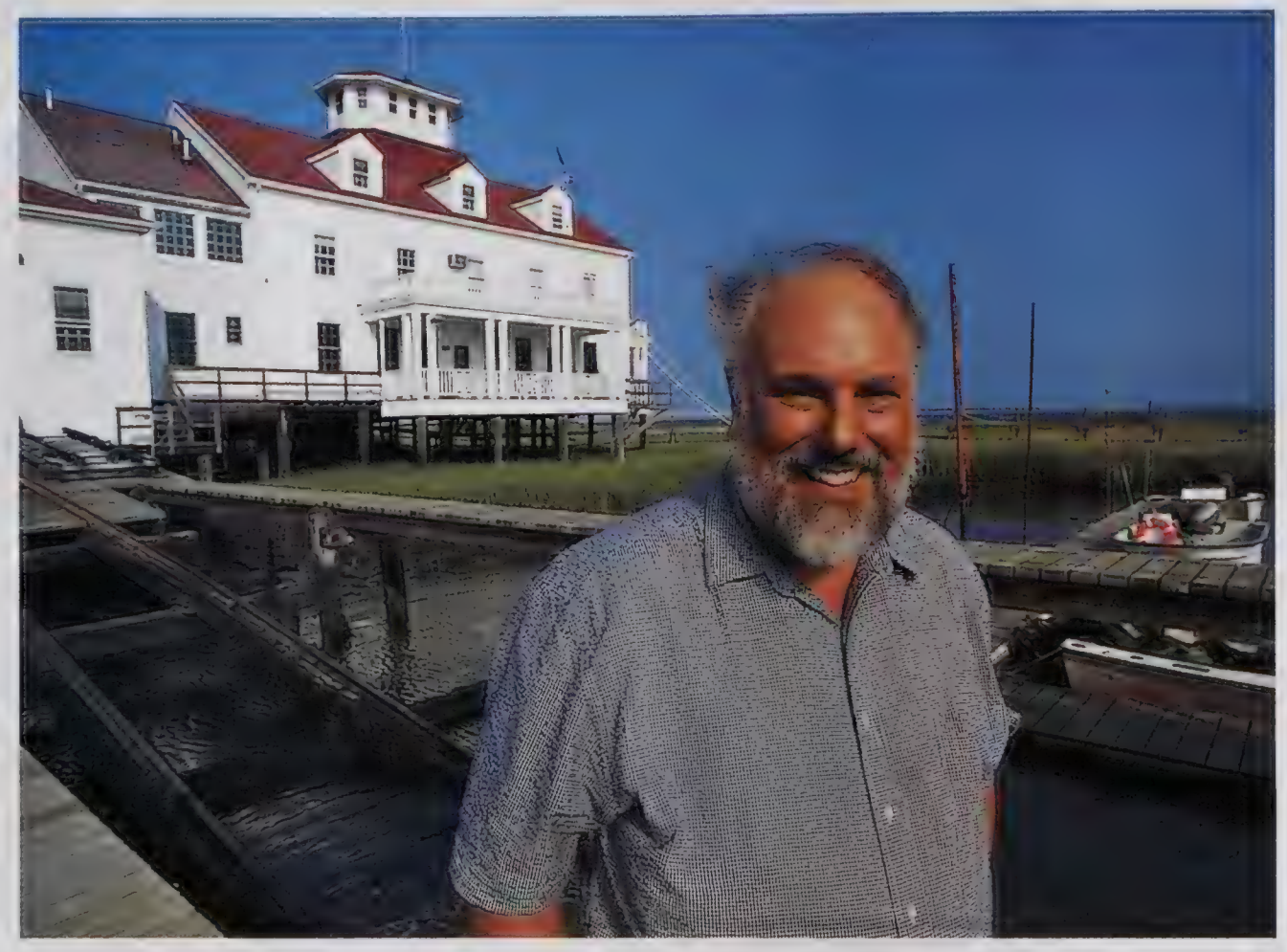
from the torpedo, heard underwater, into airborne radio transmissions, so that the shore station always knows where the torpedo is.

The system of instruments on the bottom and in the shore lab is known as LEO-15 (Long-term Ecosystem Observatory at 15 meters depth) and is largely funded by the National Science Foundation. The instruments are operated by New Jersey's Rutgers University Institute of Marine and Coastal Sciences, headed by J. Frederick Grassle. The torpedo, an autonomous underwater vehicle known as a REMUS (Remote Environmental Monitoring UnitS), is the work of the Oceanographic Systems Laboratory at Woods Hole, led by Christopher von Alt. The goal is to produce a picture of the underwater environment as detailed as that which a human has of his or her terrestrial environment, with the information presented on time and distance scales important to individual organisms.

LEO-15 transmits video, sound and data on light, temperature and salinity levels, currents, wave height and period, sediment transport, plankton blooms and a variety of chemical characteristics.

In 1976, a low-oxygen event killed millions of surf clams.

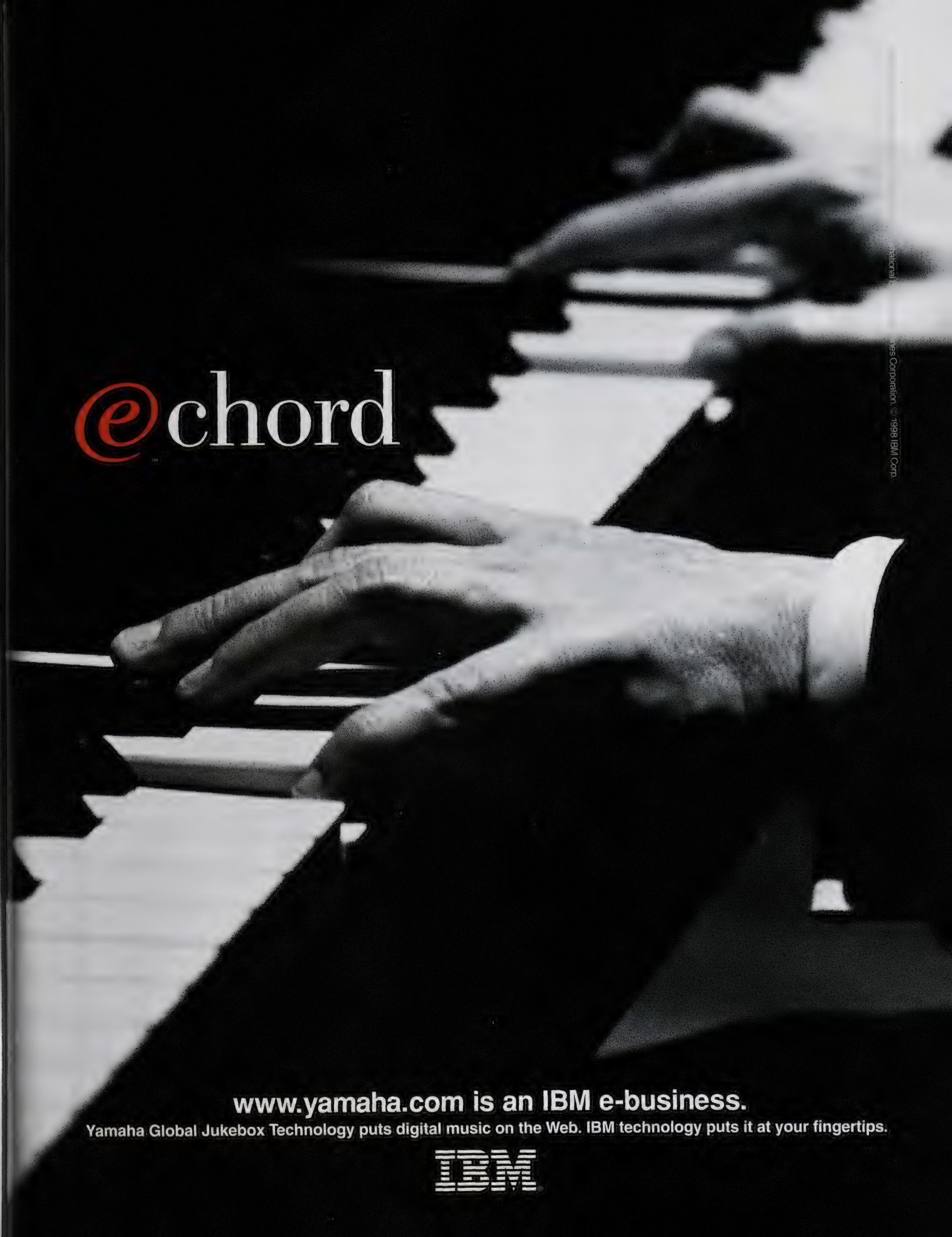
(Continual observations, at frequencies from seconds to decades, are possible, Grassle says.) LEO-15 uses acoustic Doppler current profilers to measure currents at intervals of 10 to 20 inches from the bottom to the surface. Measurements at the surface are augmented by data from a 230-foot meterological tower, Doppler radar and satellites. Ken Able, director of the Tuckerton station, is correlating current data with his work on the movements of juvenile and adult fish in and out of the estuary.



J. Frederick Grassle, director of Rutgers' Institute of Marine and Coastal Sciences, oversees the Tuckerton, New Jersey, field station, housed in the old Coast Guard station behind him.

Grassle has been an innovator before. He led the first biological expedition to hydrothermal vents in 1979. And he conducted the most intensive census yet of the very uncharismatic worms and other invertebrates in the mud off the New Jersey and Delaware coasts. He was able to show that even though environmental conditions appeared much the same throughout, the number of new species per mile suggests a biodiversity nearly as high as that of coral reefs and tropical rain forests. His main research now is focused on the communities found on the continental shelf at LEO-15.

From the LEO-15 data, scientists will be able to make physical and biological forecasts analogous to those their counterparts make on land. Last July the oceanographers at Tuckerton were delighted to hear over a local television station their forecast for a cold-water upwelling along that section of the coast. (The LEO-15 instruments had detected water from the outer continental shelf—colder than the coastal surface water by nearly 30 degrees Fahrenheit—moving in along the bottom to take the place of water blown offshore by winds out of the south and southwest.) Upwellings are important because they bring with them very high nutrient levels, which can lead to phytoplankton blooms in the water and eventual oxygen depletion as bacteria graze on the dead microscopic plants. In 1976, a low-oxygen event killed millions of surf clams, and caused half a billion dollars' worth of real and potential losses to the shellfishing industry. Pollution was suspected at first, but oceanographers now believe persistent upwelling during an unusually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hot summer led to phytoplankton blooms and then hypoxia. Since 1976 oceanographers have found that low-oxygen events tend to occur in evenly spaced places along the Jersey coast where the bottom topography traps the upwelling water, creating a circular surface current called a gyre.

The LEO-15 instruments include optical sensors to detect florescence in phytoplankton. Oscar Schofield of Rutgers, the "plankton guy," can determine not only the density of phytoplankton but its identity. As early as the year 2000, a LEO-like observatory set up in the Gulf of Maine will begin trying to predict red tides, the sudden bloom in the water of a kind of microscopic organism that can kill marine creatures and injure humans. Despite satellites, we still sometimes learn of red tides only when people call their doctors.

People are also sometimes the detectors for a far more deadly presence in the sea. Among the Navy's methods for finding mines in potential landing-craft lanes in very shallow water is the use of Navy SEALS, who roll out of rubber boats in the dark of night, swim along possible routes and ever so carefully map the explosives. Chris von Alt of Woods Hole is working with the Naval Special Warefare Command to demonstrate that an adapted REMUS vehicle could do some of the swimming now done by humans. Far more exotic plans for REMUS-type vehicles are in the works. Jupiter's moon Europa may have an ocean beneath a layer of ice (SMITHSONIAN, May 1997). An autonomous underwater vehicle is just what NASA will need when the time comes to explore the Europan ocean. Von Alt thinks of the work at Tuckerton in part as "ground-truthing" REMUS; the next step toward Europa will be to test new types of REMUS vehicles in Lake Vostok in Antarctica.

LEO-15 is a first-generation instrument system, easily serviced by divers. Once all the bugs are worked out, the Rutgers group plans more ambitious observatories, at 100 feet, 330 feet and 8,200 feet down. Similar stations are being installed elsewhere: a global Seafloor Observatory is taking shape, especially in the waters off Japan and the West Coast of the United States, where packages of seismographic and oceanographic instruments placed on the bottom are serviced by remotely operated vehicles. One of the latest is a package put on the bottom of Monterey Bay, 3,300 feet down, by an international collaboration led by the Monterey Bay Aquarium Research Institute in Moss Landing, California.

The field station, surrounded by 34 square miles of salt marsh and 22 square miles of shallow water, is ideally placed for research.

In the LEO-15 room at the shore station, computer monitors report real-time conditions out at Node B, and others track whichever REMUS is in motion at the moment. In another room, computer wizards turn mountains of data into "movies" of cold-water upwellings along New Jersey beaches. Von Alt prepares to return to Woods Hole; Grassle packs for a trip to Washington, D.C. to testify before a House subcommittee. The 48-foot *Arabella*, the 30-foot *Caleta* and the chartered *Northstar 4* return to their docks after spending the day lowering and towing instruments to supplement the LEO-15 data. After censusing fish populations in the back bays and the Mullica, five small boats unload their nets. Scientists, graduate students and postdocs, and undergraduate interns joke about the trials and tribulations of another day at sea. Little by little they disperse, walking down a long causeway to where their cars are parked. The station quiets. Five miles out at sea, however, odd-looking scientific instruments continue to pour data down the fiber-optic pipeline. LEO-15 never sleeps.

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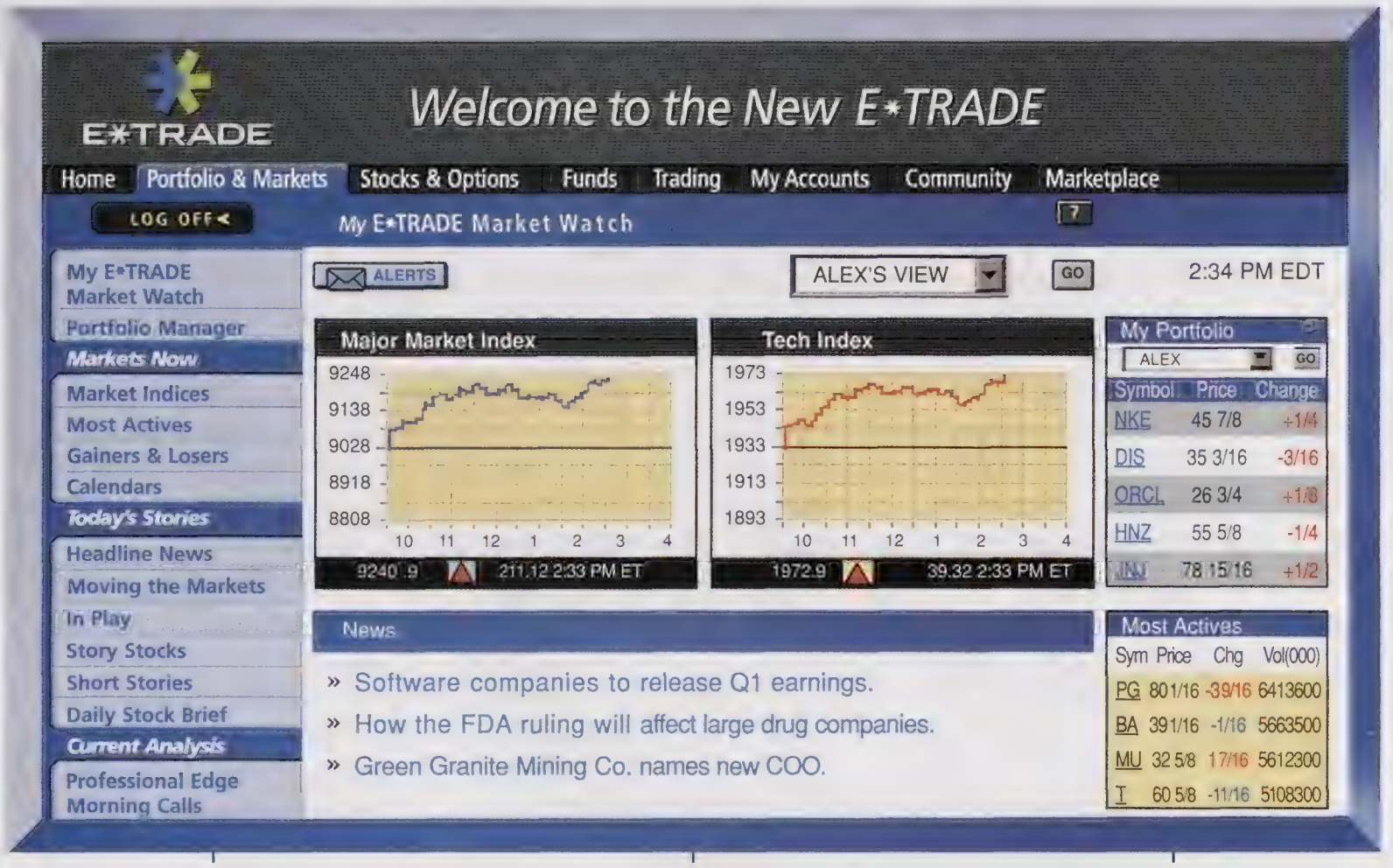

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Saving the Nation's Flag

AFTER NEARLY TWO CENTURIES OF EXPOSURE, THE STAR-SPANGLED BANNER GETS A MUCH NEEDED OVERHAUL

BY MICHAEL KERNAN

SOMETIMES I THINK I AM GETTING TO KNOW TOO much about a subject, but then I check out a detail and find that even the detail has details—and I enter a whole new level of minutiae and am fascinated all over again.

The basic story here is simple enough: they are taking down the Star-Spangled Banner, the giant American flag that hangs in the National Museum of American History, for a three-year conservation project. When it is back onstage in 2002, it will be protected from all the things that attack 189-year-old flags and will be visible from two floors of the museum in a special showcase.

The conservation will cost $5.5 million, which is coming from the Pew Charitable Trusts and other foundations. The new Flag Hall will add another $5.5 million to the $18 million project, which itself is part of President and Mrs. Clinton's call for a refurbishing of our national icons to celebrate the millennium. In response to the Clintons' campaign, Polo Ralph Lauren Corporation recently pledged $10 million to help save the flag.

Now for a few details.

The flag was ordered in 1813 by Maj. George Armistead, commander of Fort McHenry in Baltimore, who wanted something big enough for the British to see when and if they invaded his harbor. He hired Mary Young Pickersgill, age 29, a professional flagmaker (creator of ships' colors, signals, and so forth), to sew a flag with 15 stars and 15 stripes, according to provisions in the 1794 Flag Act, and measuring 42 by 30 feet. The contract was for $405.90. Such a large flag was not unusual for the time; garrison flags frequently were flown from poles at least 90 feet tall.

Mrs. Pickersgill may have bought the wool bunting and the cotton for the stars from her brother-in-law, Jesse Fearson, who owned a dry goods store in Baltimore. Then she and her 13-year-old daughter, Caroline, put the huge thing together on the floor of a local brewery.

The flag, made in six weeks of ten-hour days, required 300 yards of wool (cotton, then a luxury material, was used only for the stars, which are 24 inches in diameter) and weighed 50 pounds. It took 11 men to raise it.

Today the flag weighs approximately 135 pounds, mostly because of a linen backing added in 1914 to strengthen it, replacing a loosely basted canvas backing installed 41 years earlier. The new backing was sewn on by a team of seamstresses who put in, so I am told, more than 1.7 million stitches.

In 1914 the Smithsonian hired needlewomen to attach a linen backing to the 30-by-34-foot Star-Spangled Banner in an effort to strengthen it. They put in more than 1.7 million stitches.

UPI/CORBIS-BETTMANN

Now there's a statistic. We know there were 12 stitches per square inch, which comes to 1,728 stitches per square foot. When multiplied by the total number of square feet, that comes to a whopping 1,762,560 stitches.

Over the years other things have happened to the banner. Armistead's widow cut out one of the stars to give to a political personage, but no one knows who the recipient was. There is a mysterious upside-down *V*, or a chevron, in one of the white stripes, which could have been an unfinished *A* for "Armistead." Lonn Taylor, a Smithsonian historian, cites a letter

why?

because

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from Georgeanna Armistead Appleton, the owner's daughter, which says, "My mother sewed the red *A* on the flag," which would seem to rule out the other possibilities.

And the flag is now only 34 feet long, because the Armisteads gave away souvenir swatches. Taylor says this was common back then, there being no law against it.

During the turbulent night of September 13, 1814, in the heat of the British bombardment, a smaller flag that was used during bad weather, called a storm flag, very likely was run up over Fort McHenry. This flag, 25 by 17 feet, was also made by Pickersgill and cost $168.54.

In the morning, Armistead's men ran up the big flag. An English midshipman wrote that, at dawn on September 14, "as the last vessel spread her canvas to the wind, the Americans hoisted a most superb and splendid ensign on their battery." This was, of course, the moment when Francis Scott Key, detained aboard a British ship, saw the sight that inspired him to write the famous lines that became our national anthem.

Armistead acquired the flag sometime after the battle, and his wife inherited it upon his death in 1818. She willed it to their daughter Georgeanna Appleton. Armistead's grandson Eben Appleton loaned it to the Smithsonian in 1907 and made a gift of it five years later.

During World War II the flag was hidden away for safety in a Luray, Virginia, warehouse, appearing again in 1944. In 1963 it went to what is now the National Museum of American History. After the war, it was spot cleaned with gasoline and later was vacuumed. Luckily, as the flag aged, conservation techniques grew steadily more sophisticated. In the 1970s plans to enclose the flag were proposed and dropped; by the 1980s conservators had worked out a cleaning plan. In 1984, to protect it from light and dirt, it was covered with an opaque screen that was lowered for just five minutes every hour for an unobstructed view while the national anthem was played. Then, in 1994, the cables holding the screen broke, leaving the flag newly exposed.

Conservators soon discovered that the screen had not kept out plant material, debris from construction projects, or lint from paper and clothes, including some blue cotton fibers that may have come from blue jeans worn by many of the five million people who visit the museum annually.

Also, the wool fibers have been decaying over the years, says Suzanne Thomassen-Krauss, the conservator in charge of the entire flag project. Sunlight, heat, chemical interactions, even the oxygen in the air, cause deterioration.

But help is on the way. "We're going to lay it flat to work on it," says Thomassen-Krauss, "and there will be a big moving bridge that we call a gantry, 32 feet across, so we can work on any part of the flag."

It will lie on a platform in the Flag Hall, inside a 50-by-50-foot room. There it will be examined and stabilized so that in early 1999, it can be moved to a special laboratory in the museum. In this $1 million lab, the three-year conservation process will begin. Experts will clean the flag, evaluate whether the stitches can be removed, add new support material and attach a new mounting system.

One point of interest will be that upside-down *V*. Conservators will be looking for traces of the crossbar that would show it had been intended for an *A*.

The flag comes down this month. If the linen backing is removed, it means that each of the 1,762,560 stitches will have to be snipped, at two snips per stitch. That is 3,525,560 snips. I love stats.

When finished, the flag will probably be displayed on a tilt from the vertical to ease the stress on the hanging points. It will be housed in a four-story climate-controlled display case that could cost up to $2 million. It will be the largest case ever built for a museum artifact.

While the Star-Spangled Banner is being worked on, programs are planned to give visitors an idea of what is happening to the flag. Also, the Smithsonian and the History Channel are collaborating on a documentary, scheduled to air this fall, featuring reenactments of the War of 1812 and the bombing of Fort McHenry. Complementary educational materials are in the works, too.

And with luck, we will all be able to wake up on the morning of the millennium and know with delight that, despite all that time could do to it, the flag is still there.

The earliest known photograph of the flag, arranged by historian George Preble, was taken at the Boston Navy Yard in 1873.

COURTESY PEABODY ESSEX MUSEUM, PHOTOGRAPH BY AMERICAN ANTIQUARIAN SOCIETY

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Tea and Sisterhood

IN 1848 WHEN IT CAME TIME TO DECLARE THE RIGHTS OF WOMEN, THIS TILT-TOP TABLE PROVIDED SOLID SUPPORT

BY VALERIE JABLOW

FOR A MODEST PIECE OF PARLOR furniture, the object at hand certainly got around. As anyone can see, it is a table, three feet in diameter, suitable for afternoon tea. For more than a half century, however, it did a good bit of traveling. And on March 14, 1906, more or less at the end of the road, it stood proudly in place at the head of the casket of suffragist Susan B. Anthony. Fifty-eight years before, Frederick Douglass had described the declaration written at the table as the basis of a "grand movement for attaining the civil, social, political, and religious rights of women."

The writing took place on a steamy July Sunday in 1848. The writer was Elizabeth Cady Stanton. The pretty tilt-top table was pressed into service as a writing desk in Mary Ann M'Clintock's parlor near the village of Seneca Falls, New York. Three days before, Cady Stanton—mother, housewife and closet revolutionary—along with M'Clintock and Lucretia Mott and two other women, had called a convention. Their unsigned announcement in the *Seneca County Courier* declared the topic of discussion would be "rights of woman."

Now, with only a few days to go, the five women were overwhelmed. Nobody knew how many people were going to turn up for the meeting, and none of the sponsors had ever attempted anything like *this* before. But one thing was clear: they needed a bold statement of purpose.

Feeling pressed, Elizabeth Cady Stanton hauled out the Declaration of Independence. As the other women joined her at the parlor table, she began deftly substituting "all men" for "King George," casting men as oppressors and deniers of rights to women just as the Declaration had blamed King George for oppression of his New World colonials. The result was a declaration of rights for women, now known as the Declaration of Sentiments. With it, a movement was born.

Today, if you visit the Women's Rights National Historic Park in Seneca Falls, you can see not only the declaration but what has come to be known as the Declaration of Sentiments table. On loan from the Smithsonian's National Museum of American History, it is on display for this year's 150th anniversary of the first women's rights convention—the opening salvo in the "grand movement" that 72 years later led to the Nineteenth Amendment.

Celebrated as it is, the Declaration of Sentiments table might never have figured in history were it not for a honeymoon gone awry some years before. In May 1840, Elizabeth Cady, boldly disobeying her stern judge father, agreed to marry abolitionist Henry Stanton. Henry was about to travel to London as a delegate to the World Anti-Slavery Convention, and Elizabeth resolved to go, too—as his wife. There followed a brief wedding ceremony, with a wife's duty to "obey" her husband omitted from the vows, and an ocean voyage filled with Henry's lessons on abolitionist politics. Day by day Cady Stanton felt closer and closer to her husband's cause, and more and more at odds with her traditional upper-class home and a life that she felt was stifling to women.

But on June 12, in Freemasons' Hall in London, female abolitionist delegates found themselves relegated to a curtained gallery, denied seats on the floor and any say in the proceedings. Despite ardent voices declaring it a "matter of conscience" to include women, too many delegates insisted that the women's presence might draw public ridicule and risk damage to the abolitionist cause.

Cut off from Henry and forced into silence, Cady Stanton spent a good deal of her time in London with Lucretia Mott, America's best-known female abolitionist, in discussions of women's rights that would culminate in the Seneca Falls meetings.

The year 1848 was a grand and tur-

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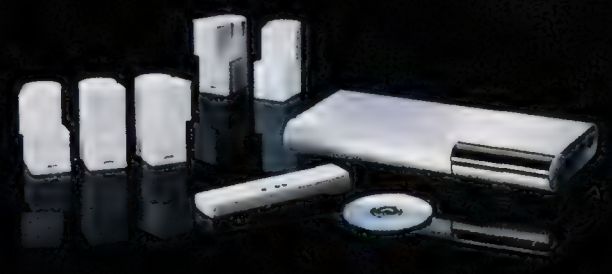

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bulent point in history. The United States had gained nearly a third of its landmass as a result of the Mexican War (SMITHSONIAN, April 1996). Gold had just been found in California. Assorted revolutions swept Europe. Slavery was abolished in France's overseas empire; the *Communist Manifesto* was published. By then, the Stantons were living in Seneca Falls. The town had become a center of temperance and abolitionist activity. It was only natural that the convention devised by Cady Stanton, Mott and the others should take place there, and be held in its center of moral activism, the red-brick Wesleyan Methodist Chapel at the corner of Fall and Mynderse streets.

Elizabeth had drawn up a list of eleven resolutions calling for dramatic reform in all areas of society. The ninth resolution proved too much for both supportive Henry and sister reformist Lucretia Mott: "It is the duty of the women of this country to secure to themselves their sacred right to the elective franchise." Henry threatened to leave town if Elizabeth presented such a crazy idea. Less theatrically (in keeping with her quiet Quaker demeanor), Mott warned Elizabeth, "If thee demands that, thee will make us ridiculous! We must go slowly."

On July 19, three hundred people gathered at the chapel—only to find its doors locked. Quick as a wink, Cady Stanton's young nephew was boosted in through a window to unbolt them from the inside.

Despite the request that only women attend that first day, at least 40 men showed up. A hurried council was held around the chapel's altar. Organizers voted in the men's favor because, as Cady Stanton's *History of Women Suffrage* politely noted, "this was an occasion when men might make themselves pre-eminently useful." One male visitor proved very useful indeed. Long an advocate of women's rights, abolitionist Frederick Douglass had assured Elizabeth Cady Stanton that he would support the controversial ninth resolution.

After brief speeches by others, it came Elizabeth Cady Stanton's turn. For the first time she read in public the declaration written less than a week before: "We hold these truths to be self-evident: that all men and women are created equal. . . . The history of mankind is a history of repeated injuries and usurpations on the part of man toward woman, having in direct object the establishment of an absolute tyranny over her. . . . We anticipate no small amount of misconception, misrepresentation, and ridicule; but we shall use every instrumentality within our power to effect our object."

Architects of the women's movement, Cady Stanton, right, and Susan B. Anthony used another table at a meeting in 1870.

The declaration was widely applauded. One by one the resolutions were approved—until the ninth. Opponents both male and female loudly denounced the demand for women's suffrage, once again arguing that such an outrageous and impracticable demand would cheapen the whole cause. Then Frederick Douglass took the floor. Unrecorded and now lost, his speech made clear that freedom was not divisible according to sex or color. The resolution passed, but barely. Exactly one hundred of those present—68 women and 32 men—finally signed the declaration.

Because the subject was so explosive, the meeting got extensive play in the press. Most newspapers lambasted the women for their "unwomanly behavior" indulged in "at the expense of their more appropriate duties." Cady Stanton wryly noted, "There is no danger of the Woman Question dying for want of notice."

Sadly, women's political progress was anything but speedy. By the time women won the vote, only one woman who signed the Declaration of Sentiments in 1848—19-year-old Charlotte Woodward—was alive to enjoy that hard-won right. But through it all, the table was there. As icon of the movement, it occupied center stage at the 50th anniversary of the women's movement. When not on display, it was kept by Cady Stanton and, later, Anthony. In 1916, the table took up residence in Washington at the headquarters of the National American Woman Suffrage Association, which was busy lobbying Congress for the vote. Fittingly, in 1919, less than a month after passage of the Nineteenth Amendment—that radical "elective franchise" first publicly demanded at Seneca Falls—the association confirmed the table's place in history by donating the piece to the Smithsonian.

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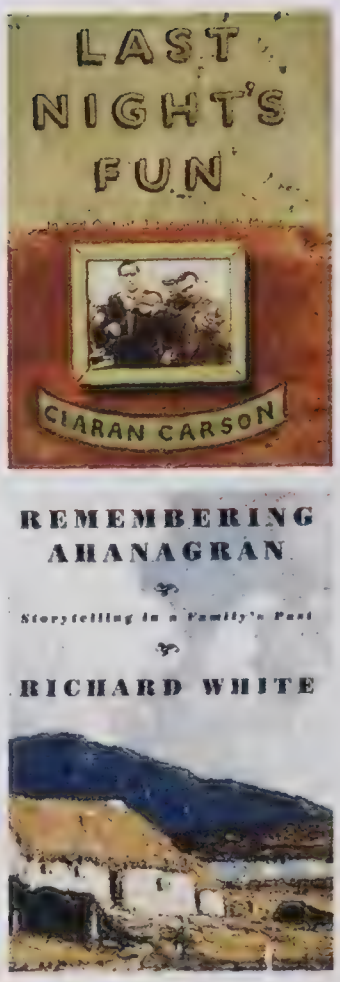

Last Night's Fun
Ciaran Carson
North Point Press, $21

Remembering Ahanagran
Richard White
Hill and Wang, $24

PURPORTEDLY ABOUT IRISH MUSIC, *Last Night's Fun* is in fact about much more. Music is the instrument with which the author leads his reader through reminiscences that have as many twists and turns as the back alleys of his Belfast youth, and the book does include passages that require a musical background to fully understand and appreciate. But in the end, one need not know a dirge from a ditty to delight in Carson's descriptions of Wellington boots, schoolrooms, movies, smoking, eating, pubs, drinking (lots of drinking), etymology—and time.

Indeed, time is a recurring theme throughout Carson's book, though the reader is not always sure of where in time he is. "We are in Ballyweird on the outskirts of Portrush, County Antrim," Carson writes in his opening sentence, "and it's the morning after the night before"—the first of many such mornings, the reader quickly discovers. Carson does eventually note, "I think it's 1979," which is often as precise as he gets.

Carson doesn't worry about such matters as clocks and calendars, however, because for him, time is as ever-changing as the tunes he describes, and the two are inexorably bound. Speaking of one Irish tune—and it could be all—Carson writes, "Each time the song is sung, our notions of it change, and we are changed by it. The words are old. They have been worn into shape by many ears and mouths, and have been contemplated often. But every time is new because the time is new, and there is no time like now."

Early on he asks the reader, ". . . do we ever fully *know* a tune, or only versions of it, temporary delineations of the possible?" It is a question he ponders—and answers—throughout his unusual book. Speaking of an "absolute version of a given tune," he writes, ". . . such a thing clearly does not and never did exist. . . . The song," he concludes, "is always open to negotiation." An accomplished flute player, Carson is also a gifted writer whose descriptions transport the reader to wherever Carson's meandering memory takes him—which is just about anywhere.

His destination could be, for example, the Belfast workshop of flute maker Sam Murray. Carson conjures up this studio in all its cluttered beauty, its "many-layered scent of shellac, beeswax, raw and boiled linseed oil, tallow, almond oil, aromatic blackwood shavings, nitric acid and ammonia. . . . I believe," he writes, "you can smell the blue steel blades and boxwood handles of the antique tools: gravers, gouges, chisels, pliers, diamond files and flat files, pincers, chasers. You can pick one up and feel its oily-sharp edge with grainy specks of sawdust on it. Then there are the immense solid lathes with their treadleboards and black cast-iron flywheels and counterweights, their headstocks and their tailstocks, their spindles and their mandrels."

He transports us, also, to O'Looney's Bar, where the author and his pub-crawling cronies arrive "by dint of polyphonic after-hours negotiation, by hooks and crooks of bendy roads and out-of-kilter crosses. . . . The floor is earth," he writes. "The smell is mould and alcohol and earth and smoke of turf and nicotine. Candles gutter in their yellow cataracts of wax. A turf fire glows at one end of the room. There is a makeshift bar at the other. In between are shapes hunched over instruments and tunes and tables. Feet pound the earth floor."

The reader can smell the food cooking when Carson describes the makings of a fry—the obligatory morning-after meal: "It's all sizzling in the pan. The almost-visible aroma wafts

Carson doesn't worry about clocks and calendars, however, because for him, time is as ever-changing as the tunes he describes, and the two are inexorably bound. "Each time the song is sung, our notions of it change, and we are changed by it."

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through the house. Soon, everything will be arrayed on mis-matched plates. We will contemplate it briefly before eating it: the wavy bacon and the frilly-crisp, flipped-over eggs; the puckered burst seams of the sausages; the milk-tooth bits of fat in the black pudding."

Carson's humor fills the book with its own brand of music—he tells a great joke—and his love of life and the love of life of those around him are evident throughout. But musicians he of course holds in special regard: Carson likens his fellow players to "chameleons" who "have independent eyes by which they recognize each other while they blink at someone else. They understand that time itself is a chameleon, so they mark it and they keep it, and they syncopate it."

Even the rain doesn't daunt these players of Irish songs. Carson describes one sodden evening of music when the pub crowd has overflowed into a jerry-built tent in the backyard. "Everyone is spluttering and laughing into their wet pints," he writes, "and they don't give a damn, for this is any-weather music." In an any-weather book.

IN A WORK HE DESCRIBES AS "AN easy collaboration between me and my mother and an uneasy collaboration between history and memory," Richard White explores the past through his mother Sara's eyes. With affection and insight, he re-creates the story of a woman, born in 1919 on a farm in Ireland that "produced children more reliably than. . . crops or cattle," who emigrated to America where, in 1941, she became the second female hired at what was to become Chicago's O'Hare Airport.

"I entered into my mother's stories so fully that I am not always sure now whether I remember my mother's stories about a place that I had never seen or my own combinations of the stories," White writes of his foray into memory. His task was sometimes hindered by Sara's Irish relatives who didn't see the point of the author's digging up a past about which they had little interest.

The Ireland of Sara's childhood was a place where the boundaries between fact and fantasy very often were blurred. "The fairies lived in this landscape," writes Sara's son, "and the dead sometimes walked among the living."

Speaking of a ruined castle in Ireland, visible from his uncle Johnny's field, the author notes, "He has passed it a thousand times and more. He has wondered about it not at all." When Sara asks her brother who destroyed the castle, "his eyes become lively as his body grows still. 'How the hell should I know who destroyed the castle, Sara!' he says." When Sara inquires about people they'd known as children, he says, "For God's sake, Sara, they're dead."

"The very idea of seeking information about the dead makes Johnny erupt with laughter," writes White. "He tries to hold it in, but his body shakes like an old building when a train passes."

The Ireland of Sara's childhood was a place where the boundaries between fact and fantasy very often were blurred. "The fairies lived in this landscape," writes Sara's son, "and the dead sometimes walked among the living." Even the author, born and bred in the U.S.A., seems to accept the reality of fairies as an integral part of Ireland's past. Dating the time Sara's father emigrated to America in hopes of earning money to save the family farm, White writes matter-of-factly, "It was roughly a year after the fairies had put Richard Mackessey's pony up the tree that Jack Walsh left for America."

Sara, too, emigrated to the States. She was 16, and it was a terrifying journey. "'All I knew of the world,' she says, '. . . was the farm where I was born and the village where we went to Mass on Sunday, with one general store there, the creamery, and the half dozen public houses.'"

Sara might have remained in the world of Chicago's Irish, were it not for the war, which swept her "into the swirl of people lifted up from all over America, moved across the country in trains, planes, buses and trucks, and mixed together in ways once unusual and now common. It was how she met my father, a meeting that would have been unimaginable in peacetime," writes White.

"There was her Irishness and his Jewishness," he says of his parents' unlikely marriage, "but there were other differences. He had graduated cum laude from Harvard. She had finished fourth grade at the Ballylongford National School." It was a union that "only the war could have made possible."

Sara does not like her son stirring up memories of his deceased father. "Here, more than anyplace else, she wants her memory uncontested," he writes. "She does not want me talking to others, gathering other stories, looking into the remnants of my father's past. When she is silent, she wants those things about which she refuses to speak to remain as quiet as the tomb."

The reader suspects from White's final sentence that he has respected those silences. "My mother's stories, and silences," he writes in his epilogue, "have made the world more dense and interesting than I ever imagined."

Writer Emily D'Aulaire is a freelancer who lives in Connecticut.

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SMITHSONIAN HIGHLIGHTS

SO MIGHT YOU EXPECT ANDREW CARNEGIE to growl, upon espying the 32-foot-high Solar Tensile Pavilion in his garden. Viewed from the inside (above), this prototype of a 21st-century, solar-powered awning tarp thing frames Carnegie's stately 1901 mansion on New York's Fifth Avenue. Both garden and mansion now belong to the Smithsonian's Cooper-Hewitt, National Design Museum. "The Cooper-Hewitt has the best museum garden space on Museum Mile," says curator Lucy Fellowes. "We've had exhibits out there on doghouse design and backpacking tents and the benches of Central Park." This year the theme is solar technology. The dark rectangles on the Solar Tensile Pavilion are photovoltaic modules, flexible pieces of silicon film .005 inches thick. In the future, such modules will come in various shapes and will be integrated into the fabric, allowing gigantic, paraboloidal, power-generating festival tents and stadium covers. Evening passersby can peer through the Cooper-Hewitt garden's wrought-iron fence at the soaring pavilion, a glass house, garden chairs with overhead lamps—for reading under the stars—and other futuristic structures glowing brightly with energy collected during the day. The Himawari (Japanese for "sunflower"), a microprocessor-controlled, sun-tracking bank of lenses, directs light through 50 feet of optical fibers to illumine two items on display inside the mansion—an ornate, pocket-size, gilded-brass compass-sundial from the 18th century, and the 1958 *Vanguard I* satellite, the first to use photovoltaics in space. *Under the Sun: An Outdoor Exhibition of Light* will be up through Sunday, October 25, the day we "fall back" to standard time. Much of the exhibition can be seen at www.si.edu/ndm.

—Bruce Hathaway

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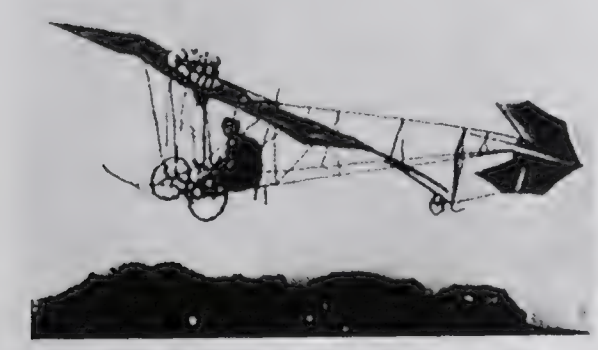
SMITHSONIAN HIGHLIGHTS

¡Arriba!

¡Arriba! The History of Flight in Mexico, Central America, South America and the Caribbean, an exhibition of 35 rare photographs and eight aircraft models, is on view at the National Air and Space Museum through November 30. The show, with text in English, Spanish, Portuguese and French, takes its name from the Spanish word for "higher," and tells how "towering mountains, vast and impenetrable jungle reaches and ferocious weather made the development of aviation in



Brazilian Alberto Santos-Dumont pilots his *Demoiselle*, c. 1909.

Latin America both a necessity and a daunting challenge." Hispanic Heritage Month continues through October 15. For information on films, lectures and a variety of other special programs, call 202-357-2700 (voice) or 202-357-1729 (TTY).

Magazine Website

SMITHSONIANMAG.SI.EDU

Another place to start finding out about the many exhibitions, events, publications, programs and activities of the Smithsonian is at our on-line address, smithsonianmag.si.edu. There you will find an expanded version of the *Highlights Calendar* with links to the many pages of the Smithsonian Institution Website.

Exhibitions, Events

NATIONAL ZOOLOGICAL PARK

Great Cats, a new, permanent walk-through exhibit-story featuring lions and tigers, opens October 1. Visitors will be able to see the cats in their outdoor habitats better than ever before, and—at an interactive learning area called Tiger Tracks—will discover why big, fierce predators are always rare and why lions and tigers have an especially tenuous hold in today's world.

NATIONAL MUSEUM OF AMERICAN ART

Eyeing America: Robert Cottingham Prints (through January 31, 1999) A print retrospective (1972-1993) featuring American scenes of city storefronts, movie marquees, logos and commercial signs.

RENWICK GALLERY, NMAA

Daniel Brush: Gold without Boundaries (through January 10, 1999) The first exhibition to showcase the artist's unparalleled jewels, precious objects and sculptures. See SMITHSONIAN, August 1998.

The Stonewares of Charles Fergus Binns: The Father of American Studio Ceramics (through January 3, 1999) Sixty elegant, Chinese-inspired stoneware vases, bottles, bowls and jars, dating from 1888 to 1943.

COOPER-HEWITT, NATIONAL DESIGN MUSEUM
[NEW YORK CITY]

The Architecture of Reassurance: Designing the Disney Theme Parks (October 6 through January 10, 1999) More than 200 artifacts, including drawings, models, posters, advertisements and historical photographs.
Under the Sun: An Outdoor Exhibition of Light (through October 25) See page 40 and www.si.edu/ndm.

NATIONAL AIR AND SPACE MUSEUM

Star Wars: The Magic of Myth (through January 31, 1999) For information on limited free same-day passes, call 202-786-2122. Advance tickets can be purchased through ProTix (800-529-2440).

NATIONAL MUSEUM OF THE AMERICAN INDIAN
[NEW YORK CITY]

The Art of Being Kuna: Layers of Meaning Among the Kuna of Panama (through March 21, 1999) Three hundred artworks, including gold jewelry, baskets, wooden sculptures, musical instru-

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Smithsonian museums are generally open 10 A.M.-5:30 P.M. daily, except December 25. Receive a free Associates' planning packet. Write to Smithsonian Information, Smithsonian Institution, Washington, D.C. 20560, or call 202-357-2700 (voice) or 202-357-1729 (TTY), 9 A.M.-5 P.M., Monday-Friday; 10 A.M.-4 P.M., Saturday-Sunday. Note: Parking is limited; Metrorail (subway) is convenient to all museums.

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FREER GALLERY OF ART

Beyond the Legacy: Anniversary Acquisitions for the Freer Gallery of Art (October 11 through March 14, 1999) A variety of Asian artworks. Exhibition celebrates the gallery's 75th anniversary. To mark the publication of *The Peacock Room: A Cultural Biography*, by curator Linda Merrill, four lectures are offered in October and November. For information, call 202-357-2700.

NATIONAL PORTRAIT GALLERY

Recent Acquisitions (through January 24) Paintings, sculpture, prints and photographs by such artists as Henry Inman, Elaine de Kooning and Jamie Wyeth, a self-portrait by Jacob Lawrence and two photographs of Marilyn Monroe by David Geary, taken when she visited Korea in 1954.
Andy Warhol's Flash—November 22 (through November 29) The artist's 14-print portfolio, with words from the popular press, about the assassination of President Kennedy.

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SMITHSONIAN PRODUCTIONS

Visit Smithsonian Productions' Website for information about their public radio programs and video products: www.si.edu/sp. Premiering in October is "Remembering Slavery." Former slaves tell their stories in recordings of first-person accounts and readings of their words by James Earl Jones, Debbie Allen, Louis Gossett, Jr., and others. Tonea Stewart hosts this two-part radio documentary. Check public radio listings in your area.

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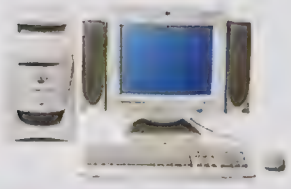

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PLANES ARE STACKED ON THE RUNWAYS

AND CIRCLING IN HOLDING PATTERNS,

DELAYS ARE PILING UP AND. . .

the dominoes are falling

BY EDWIN KIESTER, JR.

THE 220 PASSENGERS ABOARD DELTA AIR LINES flight 511 that Friday morning were becoming restless. Many had groaned out of bed at 4 A.M. for the 6:10 flight from Chicago's O'Hare airport, expecting to arrive in Atlanta at 9:05, Eastern time. Now their wristwatches showed almost 9:40, Eastern time, yet here they sat, seat belts securely fastened, while the Lockheed 1011 cut circles in the sky somewhere over northern Alabama. Pilot G. T. Lang had just announced that the plane was leaving the holding pattern—but that change would only lead to another set of circles, closer to the airport.

Steve Caisse was uneasy, too. A lead dispatcher for Delta who, at 41, had served 20 years with the airline, Caisse was sitting before a computer console in the Delta Operations Control Center in Atlanta, watching a miniature airplane trace a diagonal yellow line across the screen, representing 511's flight path to Atlanta. Caisse did not like what he saw. Directly across the plane's eastward route lay two raggedly rectangular patches of dark green surrounding patches of red and orange—severe thunderstorms blocking 511's way. Caisse clicked his mouse: a speckle of red dots showed lightning strikes, too.

Five hundred miles northeast in Herndon, Virginia, near Dulles International Airport, Pat Harten's crew saw the same picture as Caisse—with their own set of concerns. Harten is national operations manager for the Federal Aviation Administration's Air Traffic Control System Command Center. From this softly lit, cavernous space, half the size of a football field, banks of computers and giant display screens give a real-time

Planes line up for takeoff in Atlanta. Delays often occur when planes are held on the ground because their destination airport is socked in.

The first domino fell in a cascade that was to disrupt the national air traffic control system.

picture of all traffic in U.S. airspace. Hunched over the computers, studying the screens, air traffic specialists set the daily flight rules and help coordinate the work of 21 regional en route centers, 197 departure and approach facilities, and 462 airport towers.

From every vantage point, it looked like a bad day, for Atlanta and elsewhere. On a clear day when you can see forever, and pilots can see each other, the Atlanta airport can land 92 to 96 planes an hour: one every 38 or 39 seconds. Today, it could manage only one every 60 seconds. It was the harrowing job of Air Traffic Control (ATC) to sort out supply and demand.

You might think that winter, with its blizzards, whiteouts and icing, would be air travel's biggest headache. Wrong. Air traffic control managers like Harten dread much more the savage, unpredictable thunderstorms of spring and summer. In July, says Harten, there are half again as many delays as in February. Spring 1998 had barely arrived, but it had come in with a vengeance.

When, in ATC jargon, severe weather or some other problem "impacts" a major airline hub like Hartsfield International in Atlanta, the Command Center has three basic ways to ease the pressure. The least draconian is to lengthen the prescribed distance that must be maintained between planes headed in the same direction—increasing it to 15 miles, say, instead of the standard 5. Or, in the most severe cases, ATC can initiate a ground-delay program, which pushes back departure times for all airlines' flights to the impacted airport, so that the planes arrive at systematic intervals and do not overwhelm the facility. "It's a way of spreading the pain," Harten says. A middle choice is a temporary "ground stop," keeping flights destined for the impacted field on the ground for a specified period of time to allow those already in the air to land. A ground stop usually is limited at first to airports within 1½ hours' flight time of the impacted destination.

At 8:25 A.M., Eastern time, while the passengers on Flight 511 were dozing or finishing their breakfast, ATC had ground-stopped Atlanta. The first domino fell in a cascade that was to disrupt the national air traffic system—not to mention the travel plans of hundreds of thousands of travelers—as far away as Los Angeles.

Some 21,000 commercial flights are scheduled daily within the United States, with no more than 5,000 planes to fly them. The result is an intricately cadenced shuffle that Jack Kies, program manager for the Command Center, calls "a multidimensional chess game." The average airliner flies more than four flight segments a day; on smaller airlines, the average is more than seven. All these flights must be woven into a traffic pattern that includes roughly twice as many military and private flights, so that some 70,000 individual flights crowd the skies every day.

When the weather, airport operations and the mechanical whims of aircraft cooperate, this exquisitely timed ballet can work. But each day begins an elaborate dance in which ATC, the airlines' own operations centers, crews aloft and crews on the ground struggle to get passengers and planes to their destinations on time and then onward to the next stop. "Obviously, we can't bat 1.000 every day," Kies says. On a perfectly ordinary Tuesday three days earlier, ATC—which keeps track of the flight delays it has a hand in—had congratulated itself on only 834 delays across the system. (A flight is considered late when it arrives 15 minutes or more after the scheduled time.) More than 20,000 hits in 21,000 times at bat might seem an impressive batting average, but it is not much consolation to the businessman sitting on his attaché case in Phoenix, impatiently waiting to board a 727 still on its way from Dallas.

When Flight 511 took off from O'Hare at 6:47, Central time, plane, pilots and flight attendants had a typical full day of hopscotching ahead. An hour after arrival in Atlanta, the L-1011 was to transform itself into Flight 1737 and ferry some 240 passengers to Los Angeles, arriving at

National operations manager Pat Harten talks on the telephone at the FAA's Air Traffic Control center in Virginia. Behind him, from

PP. 48,49 NICK GUNDERSON/TONY STONE IMAGES

left, are Don Bringman, Jim Grimm and Mark Libby. Right: One of the center's many screens displays storms across the country.

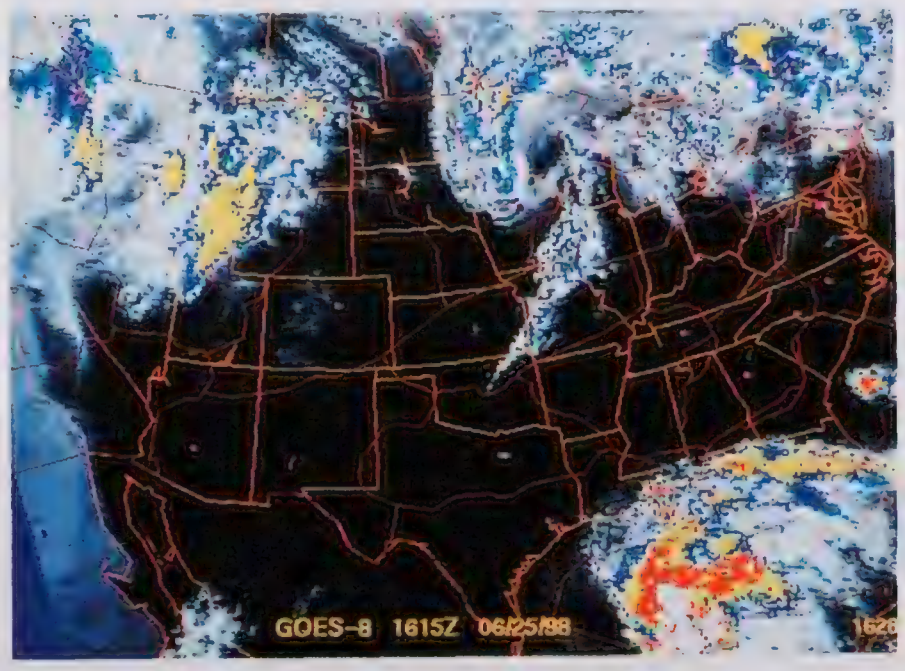
11:54 A.M., Pacific time. At 1:05 P.M. Flight 1737, now designated Flight 240, was to return to Atlanta with another 240 passengers, then go on to Tampa as Flight 877, where it would remain overnight before beginning a new round next morning. After completing the flight from Chicago to Atlanta, Captain Lang's cockpit crew was to take Flight 414 at 10:20 to Orlando, return to Atlanta, then go on to La Guardia in New York, while the eight flight attendants would transfer to Flight 269 for Los Angeles, return to Atlanta on Flight 240 and then backtrack to O'Hare.

From his console, Caisse could already see that this ambitious timetable could hardly be fulfilled. Like the Herndon center, the Delta Operations Control Center is dominated by huge video screens; that morning, one showed radar pictures of the storm patterns around Atlanta, and another, with a camera trained on the airport itself, displayed wind-whipped rains lashing the runways. The center was abustle as flight dispatchers tried to keep up with one of the worst storms of the year.

As do licensed dispatchers at other airlines' operations centers, Caisse and the other Delta dispatchers on duty share responsibility with the pilot throughout each flight, making joint decisions about such matters as takeoff and route. The dispatcher also reports the flight's progress to the "bridge," the unified flight-control command post where broader, strategic decisions are made about Delta's full complement of nearly 2,700 flights a day worldwide. Under airline rules, a dispatcher notifies the bridge when a flight will be more than 15 minutes late or is holding, or when connecting times will be less than 30 minutes. At 9:30 A.M., dispatcher Mark Hopkins told the bridge that 511, whose arrival time had already been pushed back, was still behind schedule and holding. "With that one keystroke," said Caisse, "he put dozens of people to work."

The impact at Atlanta was snowballing, Pat Harten was to explain later. "If you have 90 planes scheduled to land that hour, but you can only land 60, then if you stick to the schedule, the next hour you may have another 60, plus the 30 left over from the first hour. Now you have 90 again. And in the third hour, you may expect yet another 60. You have to do something to smooth out the demand."

"Collaborative decision-making," says Keith Morris, assistant manager for quality assurance and training at the FAA's Command Center, "that's the wave of the future



for us." In a series of daily teleconferences, beginning at 5 A.M., that link the Command Center, the en route traffic control centers and the major airlines, the day's outlook is discussed, including the weather, the potentially impacted airports and the constraints on traffic. "Everyone has input, we listen to them, see if their weather forecast differs from ours," Morris says. "Basically we tell them the situation and our proposed response to it, and they work out their responses based on that information, the go or no-go. We let them run their own airlines, although we make the final call."

For example, when an airport can only accommodate a limited number of arrivals, the airline may decide which of its flights receives priority: a plane that is low on fuel, one connecting to international flights or one with a full load of passengers with tight connections. Many decisions once were made unilaterally by the FAA, but airlines are

PP. 50,51 REGIS LEFEBURE (2)

Hartsfield's acceptance rate was now below 60 landings per hour, but more than 100 aircraft were en route.

increasingly gaining control over their own destiny, Morris says. Recently the FAA has relaxed its rules that all flights must follow a prescribed route, allowing the individual airlines, with advance notice to the FAA, to choose a route that guarantees better ride and greater fuel economy.

"Yesterday we had 27 requests for route change. We approved 24 of them," Morris says.

Three hours before Flight 511's takeoff, midnight-shift dispatcher Charles Plunkett had filed its flight plan, a fairly direct south-southeasterly route. He concluded that heavy weather might delay landing, so he had ordered enough additional fuel for about an hour and 15 minutes of holding time. He designated an alternate airport—Columbia, South Carolina, some 200 miles to the east—in case of problems in Atlanta.

Now Lang, the pilot, was reporting that after holding for 40 minutes, he was getting low on fuel. "If I'm going to hold much longer, I'll have to go to Columbia," he told Hopkins, the Delta dispatcher, "Or, how's Birmingham?"

"Not Birmingham," Hopkins said. "Maintain Columbia."

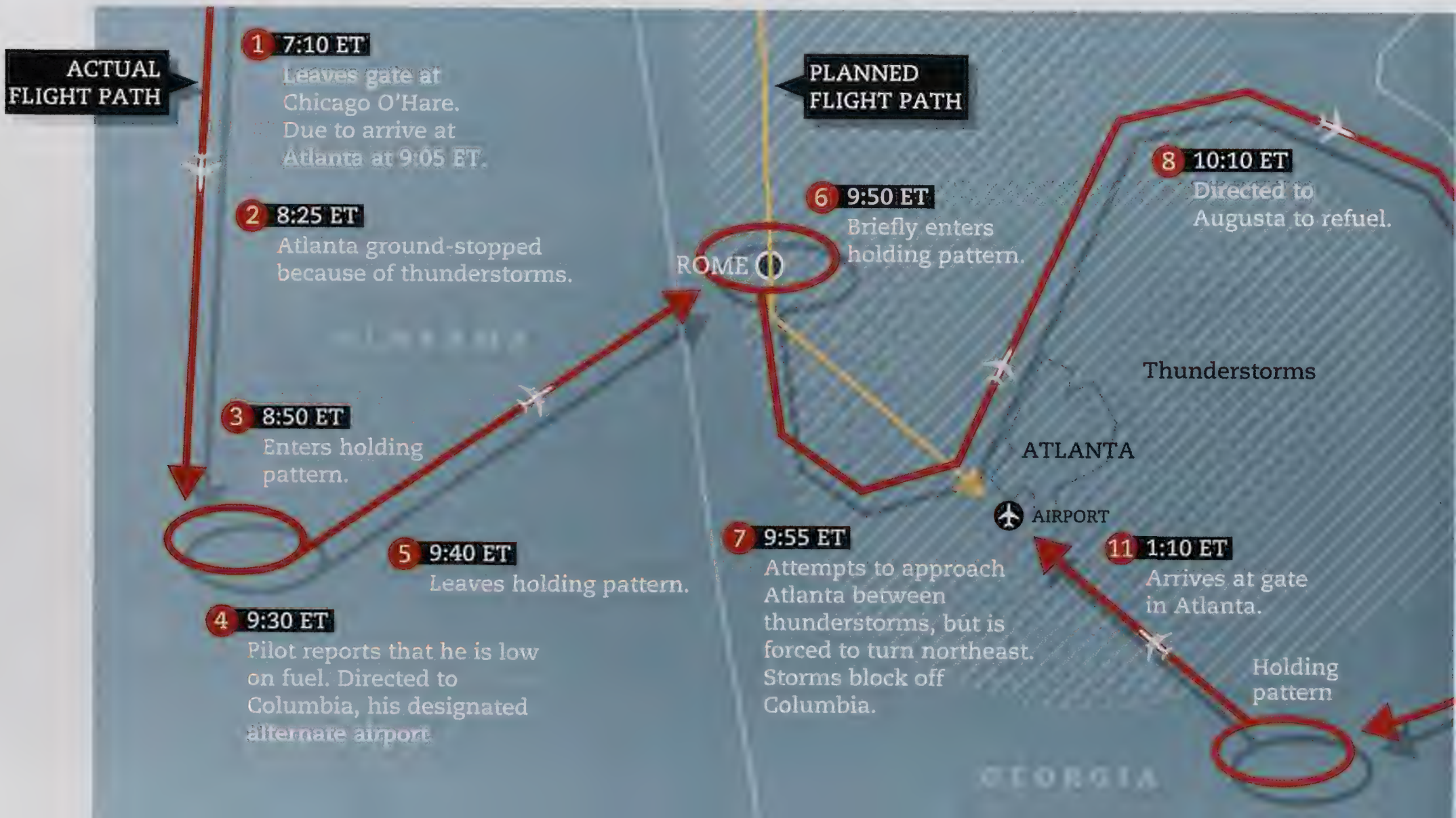
"I'll head for Columbia in the next five or ten minutes," the pilot reported.

With 622 Delta flights scheduled to arrive in Atlanta that day, and an equal number of departures, Flight 511 was by no means the Delta Control Center's only problem. Another Atlanta flight, for instance, had left O'Hare an hour after 511. It had followed a more westerly route but was now also holding short of Atlanta, and its pilot was asking about weather conditions at his backup airport, Greenville-Spartanburg, South Carolina. Hartsfield's acceptance rate was now below 60 landings per hour, but more than 100 aircraft were airborne, holding en route to Atlanta, having taken off before the ground stop went into effect. Along with 511 were flights from Air Canada, Continental Airlines, British Air, U.S. Airways, Atlantic Southeast and American Airlines.

Under the widely used hub-and-spoke system, Atlanta is Delta's major hub. Flights converge in waves, or "banks"; after an hour or so, to allow connecting passengers to switch planes, a wave sweeps out again, after which there may be a long lull before the next wave. "It's enormous peak and valley time," ATC's Jack Kies says.

The 136 passengers on Flight 511 who had expected to take connecting flights after reaching Atlanta were visualizing missed business appointments, missed family reunions, shortened visits. But now they were given a faint glimmer of hope. Studying his cockpit weather radar, pilot G. T. Lang had spotted a break between the red, yellow and green of the thunderstorms on his radar. After check-

JOHN GRIMWADE


ACTUAL FLIGHT PATH
1 7:10 ET
Leaves gate at Chicago O'Hare. Due to arrive at Atlanta at 9:05 ET.
2 8:25 ET
Atlanta ground-stopped because of thunderstorms.
3 8:50 ET
Enters holding pattern.
4 9:30 ET
Pilot reports that he is low on fuel. Directed to Columbia, his designated alternate airport.
5 9:40 ET
Leaves holding pattern.
PLANNED FLIGHT PATH
ROME
6 9:50 ET
Briefly enters holding pattern.
7 9:55 ET
Attempts to approach Atlanta between thunderstorms, but is forced to turn northeast. Storms block off Columbia.
8 10:10 ET
Directed to Augusta to refuel.
Thunderstorms
ATLANTA
AIRPORT
11 1:10 ET
Arrives at gate in Atlanta.
Holding pattern
GEORGIA

ing in with Atlanta, he was given the OK to approach. Caisse watched admiringly as Lang left his holding pattern above Rome, Georgia, and carefully threaded the L-1011 through the narrow gap, a direct path toward Atlanta. "He can see the weather immediately in front of him better than we can down here," Caisse said. "He's coming right through that nice little corridor. He's down to 15,000, and he's out of the lightning and the heavy precip. But if he gets down here and can't shoot the approach, he still may have to divert."

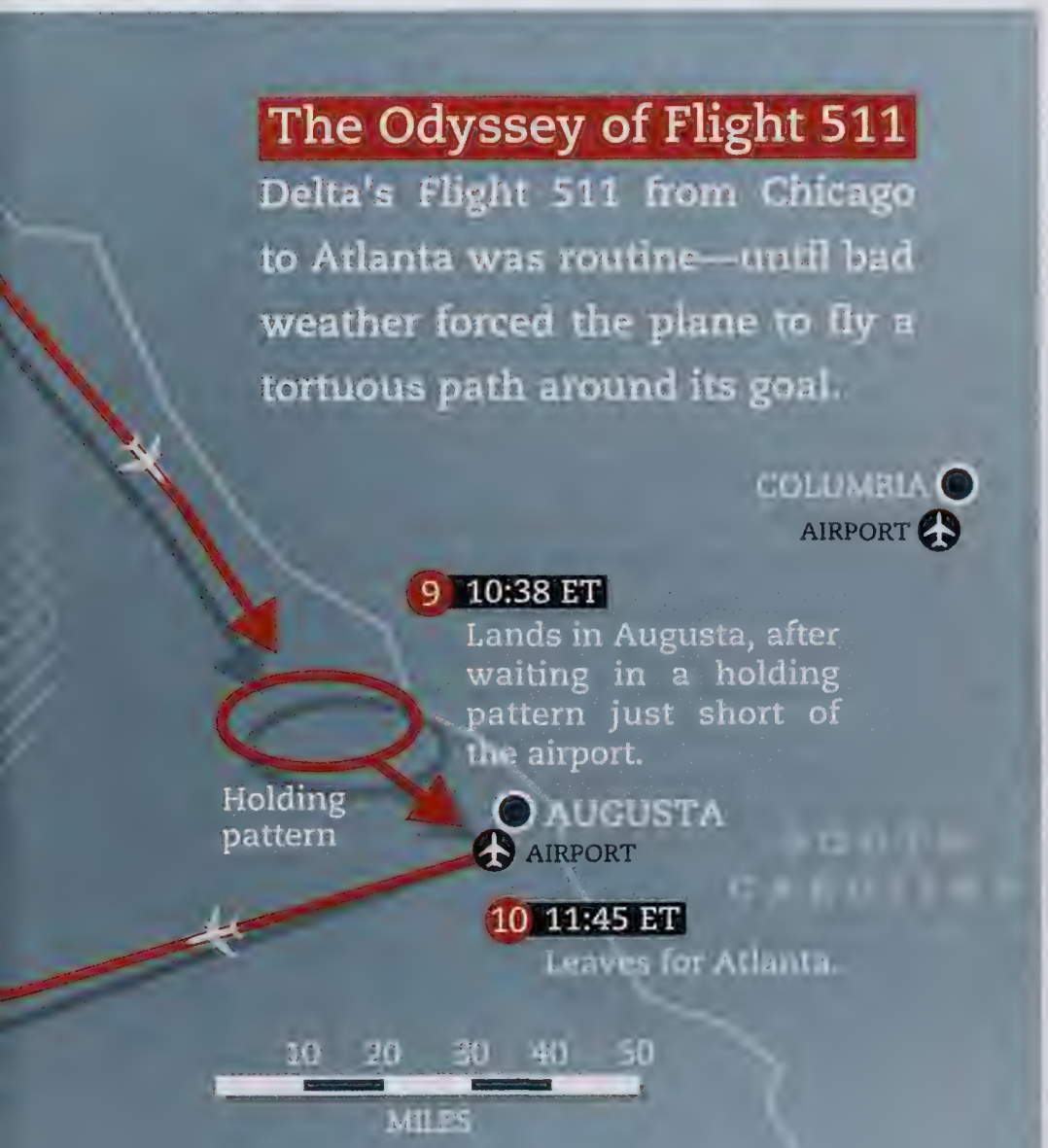
Caisse had been through this many times; as recently as two nights before, when he was working the Northeast corridor, a series of savage thunderstorms had hammered airports in New York, Philadelphia, Baltimore and Washington. At one point La Guardia had approached gridlock: the airspace was so saturated with planes unable to land that planes parked on the ground could not depart, because there was no room in the air.

One traveler bound for Atlanta that night had spent three hours on the tarmac at the closed Ronald Reagan National Airport in Washington, D.C. while thunderstorms and high winds rocked the plane, and his experience was repeated all over the Northeast. Caisse had been obliged to divert four Newark-bound flights on his watch alone, because of weather—"I don't normally have more than one or two diversions in a month"—sending one as far as Pittsburgh and another to Newburgh, New York. In the midst of these maneuvers, a southbound aircraft had reported that a child passenger was having a seizure; while juggling the other flights, Caisse had arranged for a diversion to Knoxville for medical aid. By 1:30 A.M., all the delayed flights had landed safely, some of them three hours late. "The passengers were fine," he says, "but I definitely earned my pay that night."

On the giant screen, it was now clear that the storms had moved right over the airport. That was not good news for 511. "He's turned back to the northeast, trying to go on the backside of the weather," Caisse said, studying the tiny icon on the screen. "He can't do that very long. He's

REGIS LEFEBURE

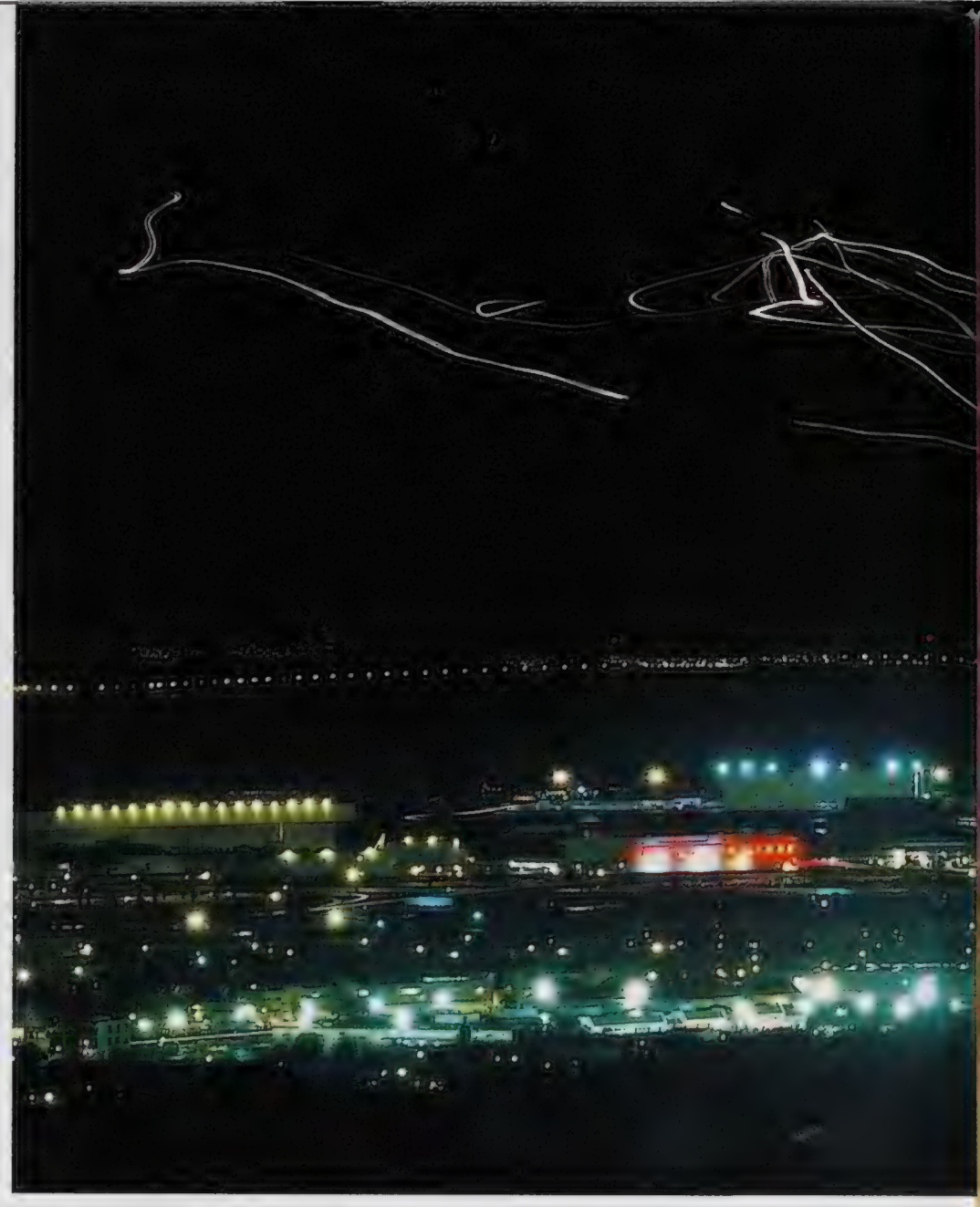
Delta Air Lines dispatcher Steve Caisse works with pilots in the air to suggest alternate flight paths around storm cells.


The Odyssey of Flight 511
Delta's Flight 511 from Chicago to Atlanta was routine—until bad weather forced the plane to fly a tortuous path around its goal.
COLUMBIA AIRPORT
9 10:38 ET
Lands in Augusta, after waiting in a holding pattern just short of the airport.
Holding pattern
AUGUSTA AIRPORT
10 11:45 ET
Leaves for Atlanta.
10 20 30 40 50
MILES

going to need fuel. I think he's going to have to divert."

An airline is required to carry enough fuel to reach its scheduled destination, plus enough to proceed to the designated alternate field, holding when necessary, and still land with a prescribed reserve. In 511's case, the alternate airfield was Columbia. But Columbia lay to the east, the direction the storm was heading. "I don't see how he can get there," Caisse said. "They're already getting clobbered. He can't go back through the weather to Birmingham. He can't go north to Knoxville, because there are thunderstorms there, too. He has to go south."

As if reading Caisse's mind, dispatcher Hopkins now focused on a more southerly fallback—Augusta, Georgia. Augusta was also 50 miles closer than Columbia. Heading for that airport would help 511 conserve its dwindling fuel supply and buy holding time. An L-1011 (a "gas hog" among jets, says Hopkins) must have 11,270 pounds of reserve fuel on landing, enough for 45 minutes' more holding time. Flight 511 was not going to be able to keep hold-



ing much longer near Atlanta without tapping into that reserve. At about 10:10, Hopkins diverted 511 to Augusta to refuel. The announcement on the plane's intercom brought groans from the passengers.

The dominoes were falling, one by one. Flight 1737, the L-1011's next hop, had already been rescheduled from 10:10 to 10:55. "That's in jeopardy," Caisse said. Delta was to carry 335,000 passengers that day, but a display showed that only 66 percent of flights could be completed on time. It was not a happy time to travel. At the Hartsfield gates, Flight 1737's customers were already grumpily waiting. Some of them, in colorful shirts, had planned to go on to Hawaii; their vacation plans were already dented.

On the bridge Ron McElroy, a sector manager covering the Southeast that day, shook his head at the havoc wrought by the weather, the ground stops and 511's diversion. He began to rearrange the dominoes into a makeshift schedule. "Some steps had to be taken," McElroy understated. "For Flight 1737 to Los Angeles, I had a crew but no plane. For 414 to Orlando, I had a plane but no crew. So I deliberately delayed 1737 until I could call a crew, and I took its crew and put them on 414. The flight was still an hour late, but that was better than three hours; anyway, I couldn't have let 414's plane tie up the gate for that long. The plane that had been 511 was supposed to go to L.A. as flight 1737, then back to Atlanta, before ultimately heading for Tampa. But it was running hours behind schedule. I didn't want to extend the delay all the way to Tampa, which would snowball the problem into tomorrow, so I arranged to steal a later inbound plane that was to overnight here and sent that on the route of Flight 877 to Tampa. We call that 'stubbing.' The Tampa flight was an hour late, but, again, at least not three."

On landing, the plane's fuel load was down to 14,300 pounds, just 3,000 pounds above the minimum.

Hopkins' "single keystroke" had galvanized passenger service, too. The 136 connecting passengers on 511 were headed for 37 different destinations throughout the South, West and Caribbean. Ten were headed for Huntsville, Alabama, alone; 20 were on their way to the beaches at Panama City, Florida. The staff scrambled to find seats for the displaced on later flights. "We have to follow a priority system," said customer-service specialist Melanie Landrum. "Special needs passengers first, then full-fare passengers, then our Medallion passengers, then the others. Sometimes we call other airlines that might have open seats. Our goal is to have every passenger at his or her destination within two hours of the original time. Sometimes, with diversions and traffic loads, that's a hard call."

On the bridge, Delta's flight control had now taken 52 flights completely off the schedule. Managers were debating more cancellations. "Canceling is a ticklish business," Matt Fronzak, a sector manager, was to say. "I used to work closely with passenger service, and I shudder every time I push that cancellation button, because there's going to be a lot of unhappy people on both sides of the counter." Recently, Fronzak had canceled flights in and out of Colorado Springs when a blizzard threatened the airport. One set of flights had been from Dallas to Colorado Springs and on to Cincinnati, and the reverse order.

"Things have to balance," Fronzak says. "You want to have the plane in the right place to complete its rotation. When I canceled the flight out of Cincinnati, I still had a plane there to fly the next day. Same thing in Dallas. You don't want to send a plane off and not be able to land in Colorado Springs and get it hung up in Farmington, New Mexico, or someplace where you have no facilities for plane or passengers and it's two or three days before you can get it back in the loop. Better to send the passengers waiting in Colorado Springs to Denver or somewhere, where we or XYZ airline can take them on

SCOTT HIGHTON

The lights of planes landing on two runways at San Francisco International Airport, caught in a 20-minute time exposure, suggest the huge load of traffic handled by a major airport. The lights in the distance are on the far side of San Francisco Bay.

to their destination. That keeps the planes in action."

At embattled Atlanta, the ground stop had been extended, briefly canceled and renewed again, with another flurry of flight diversions and cancellations. Dismayed students, traveling on Spring Break, found that Fort Lauderdale flights headed the "canceled" list. Delta began shuttling passengers between Atlanta, Birmingham and Montgomery by bus. The plane that had left O'Hare an hour behind 511 had landed in Greenville-Spartanburg. And 511's woes continued. Headed for Augusta, Captain Lang had to fight the weather once more and then enter a new holding pattern short of the airport.

At 10:38 A.M., 511 at last touched down in Augusta. Its passengers had been airborne for nearly three hours on what is normally a flight of less than two hours, and were still 150 miles short of their goal. The plane's fuel load was down to 14,300 pounds, just 3,000 pounds above the minimum. "The plane's safe and the passengers are safe, but they had a bumpy time," said Caisse, the Delta dispatcher. Crews swarmed over the plane, pumping in fuel, giving passengers a few minutes to stretch their legs. At 11:45 the L-1011, loaded once more, turned around and took off again for Atlanta.

While the plane was en route, Caisse's computer screen showed more bad news for the Huntsville passengers. The luckiest among them had been squeezed onto the next available flight, 785, scheduled to depart at 1:40 P.M. But the MD-88 assigned to that trip had been held up by weather in Greenville-Spartanburg, and the departure for Huntsville had been pushed back to 2:40. "After all they've been through," Caisse said, "the gate agent is going to tell them their flight is an hour late, and when they finally get to Huntsville they'll be at least four and a half hours late."

And 511's troubles continued to ripple through the system. In Los Angeles, customer-service agents were phoning passengers booked on the Los Angeles-Atlanta return journey of the plane that had been 511, warning that their flight was three hours late. The outbound segment had now been postponed until 1:30, nearly three and half hours behind schedule. Another Delta flight for Los Angeles, scheduled for noon, would also not leave until 1:30; it was awaiting the flight attendants still en route from Augusta.

In Los Angeles, the flights' late arrivals piled one complication on another. Besides the Hawaii-bound, many of Flight 1737's passengers were to go on to San Francisco, Seattle and other Western points. Now low ceilings and reduced visibility had forced a ground stop for San Francisco. The arrival rate was cut in half.

"It's a tough decision that we face every day, with no easy answers," Caisse said. "Do you inconvenience 90 waiting passengers to accommodate 10 who haven't landed yet? Or do you try to load those 10 on later flights? But

suppose you can't. Suppose it's the last flight of the night. The other night, when the flights were delayed from the north, we held the short-haul flights—Birmingham, Montgomery, Augusta, Savannah—to accommodate connecting passengers. Suppose you were a Montgomery passenger who came to the airport on time and learned your flight was delayed an hour waiting for these connecting passengers. You'd be annoyed. Then suppose the plane departed for Montgomery an hour late, and then you were told, 'Montgomery's now below landing limits because of fog, so we're turning back to Atlanta.' You'd be more than annoyed. You'd be mad. You'd be right back where you started, hours later, and through no fault of your own. It doesn't make people happy, and it certainly doesn't do anything for our business.

"On the other hand," Caisse notes, "the people who made their connections because we held their flights would be delighted."

"Every day I come to work and I'm handed a box with a jigsaw puzzle in it. There's a picture on the box of how the puzzle should look."

On a night when the weather has won, airport managers have one last play: wheel out cots for stranded passengers.

It was 1:10 in the afternoon when Flight 511's passengers finally trudged down the jetway in Atlanta. Though 511 had been forced to hold short of Atlanta, it was then given priority by ATC's diversion-recovery program, allowing it to land ahead of other waiting flights. Some exhausted passengers greeted friends and relatives, while others rushed off to the customer-service desk to see what arrangements had been made for their outgoing flights. It was still raining heavily in Atlanta and throughout the Southeast, but delays had been reduced, the ground stop had been lifted, and despite weather and the beleaguered air traffic control system, they had arrived, if not at their ultimate destination.

The day was not over for either the Herndon ATC System Command Center or the Delta Operations Control Center, however. A new line of severe thunderstorms swept in after 5 P.M. Hail, torrential rain, lightning and savage winds lashed the runways. Arrivals and departures were completely shut off for half an hour during the Hartsfield airport's busiest time. ATC ordered a ground stop, extended the ground stop, then made the ground stop nationwide, keeping all Atlanta-bound traffic on the ground at every airport in the country.

The ground stops were not lifted until 9 P.M.; flights were continuing to arrive long after midnight. The "mess," in Caisse's word, was not straightened out until the following day. More than a dozen additional flights had been diverted and "countless others" had been canceled.

Nationally, the Command Center reported 1,390 delays, double its normal number. The cost to the airlines, in dollars and in the inconvenience and frayed nerves of the passengers, was stiff. The delay and diversion of 511 alone had cost Delta $100,000 in fuel, additional wages, ground crew overtime, hotel expenses and fees to other airlines, according to Ron McElroy's "conservative" estimate. Delays are now costing airlines $2.5 billion a year, according to the Air Transport Association, and the costs are expected to rise. Delta officials have suggested that if, over the next decade, its average flight is delayed by just a few more minutes, it will no longer be able to call itself a scheduled airline; airports and airspace would be so overwhelmed that it could no longer meet schedules. Southwest declared that increasing airport delays threaten to reduce the number of segments flown by each of its planes by one flight, enough of a difference to mean that the airline would no longer be able to offer the low fares that make it competitive.

"A multidimensional chess game," Jack Kies had said of the many moves and countermoves that had to be made by an air traffic system stressed and stressed again. Sector manager Fronzak had a different analogy. "Every day I come to work and I'm handed a box with a jigsaw puzzle in it. There's a picture on the box of how the final puzzle should look. But while I'm trying to assemble it, people come around, things happen and pieces disappear. Then I have to fit things together as best I can, without all the pieces. Usually it comes out all right."

Edwin Kiester, Jr., who last year wrote on jet lag, flies often from California to both Europe and the Philippines.

TOM BOYLE, AP WIDE WORLD PHOTOS

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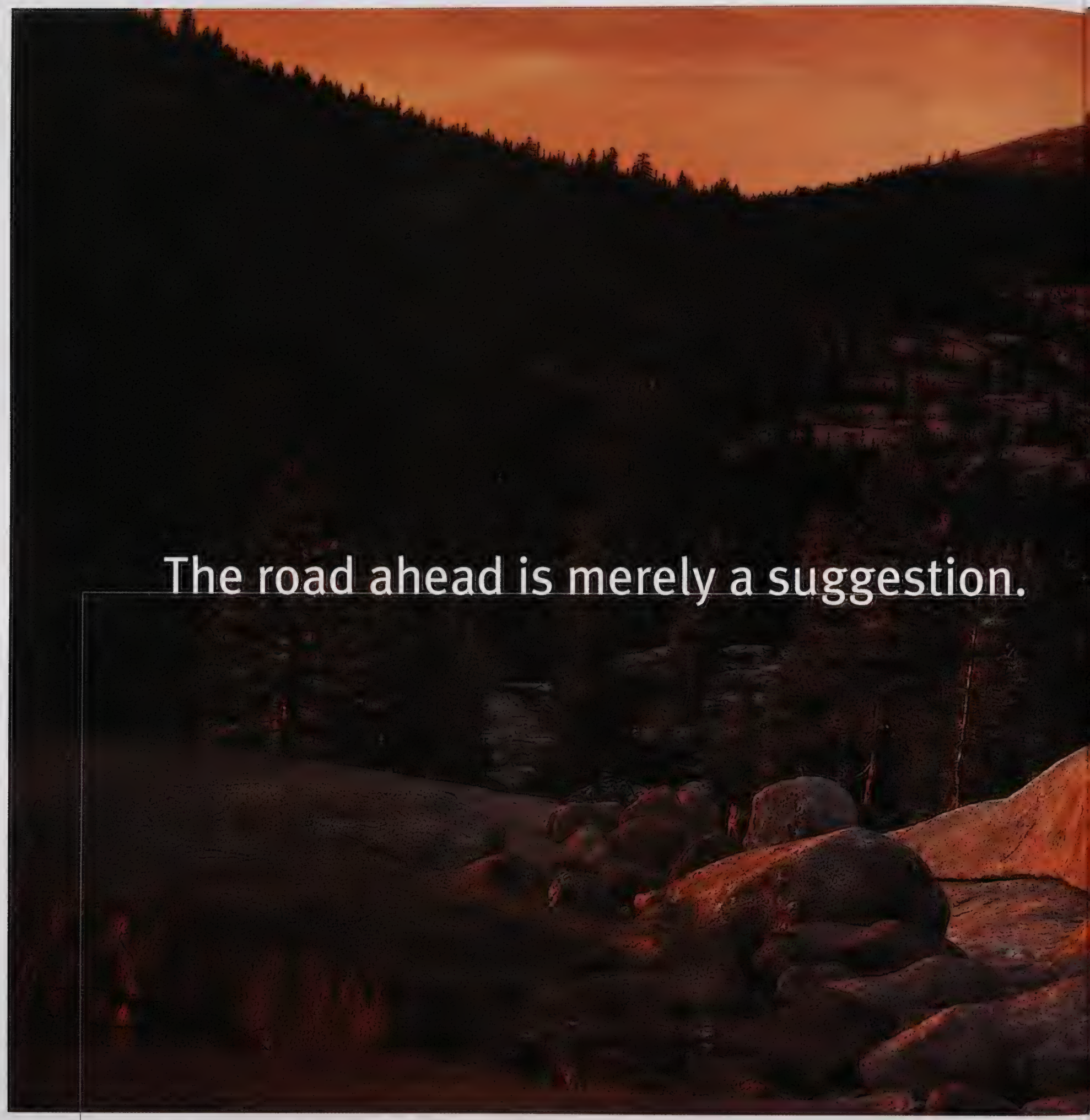

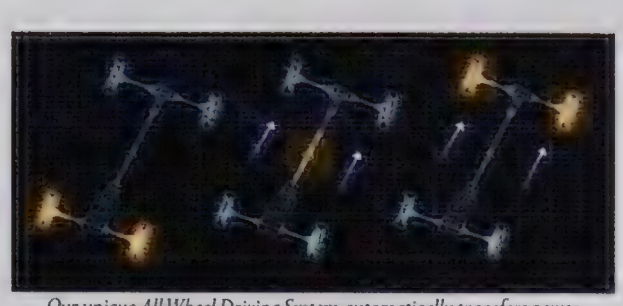

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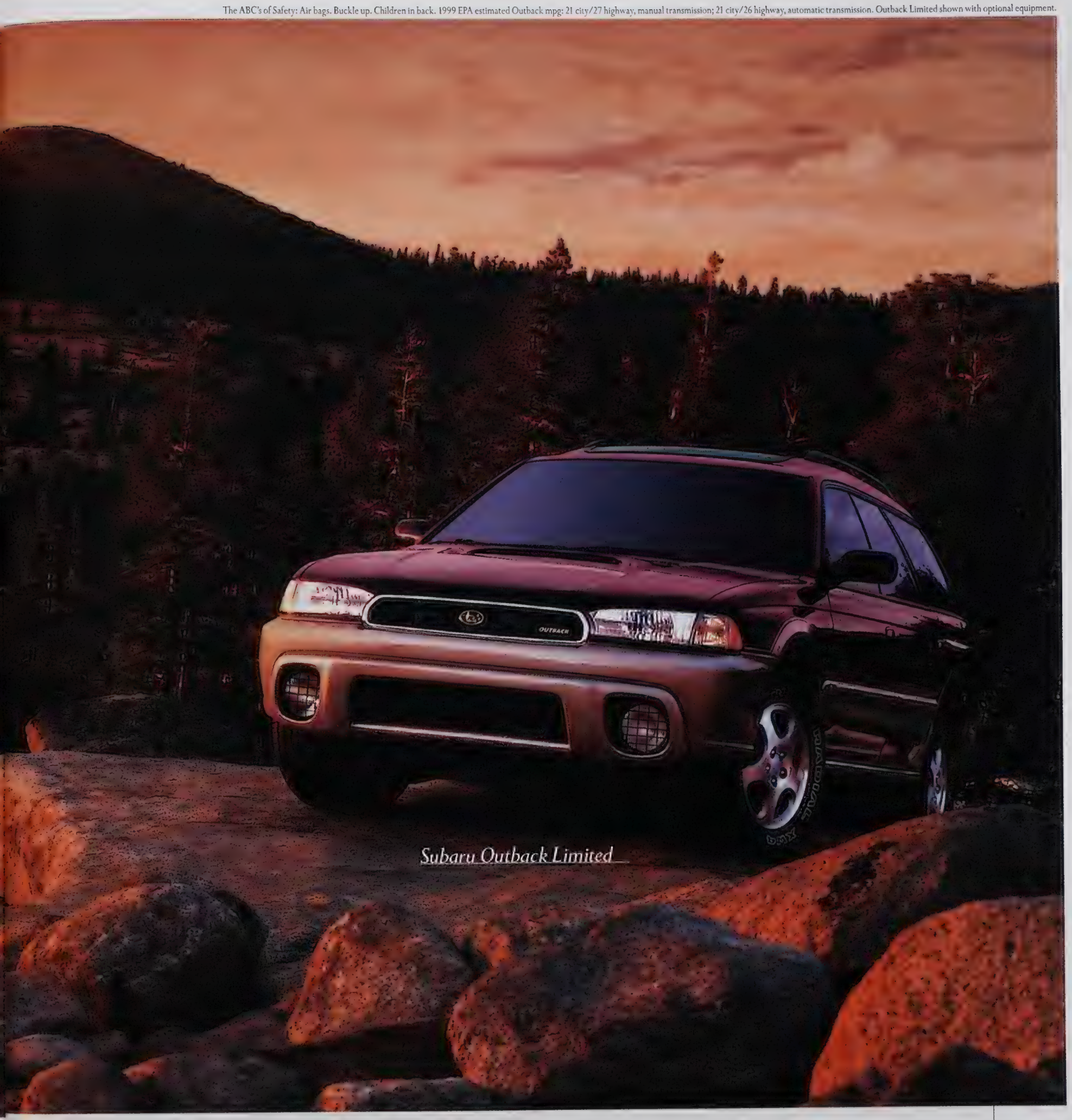

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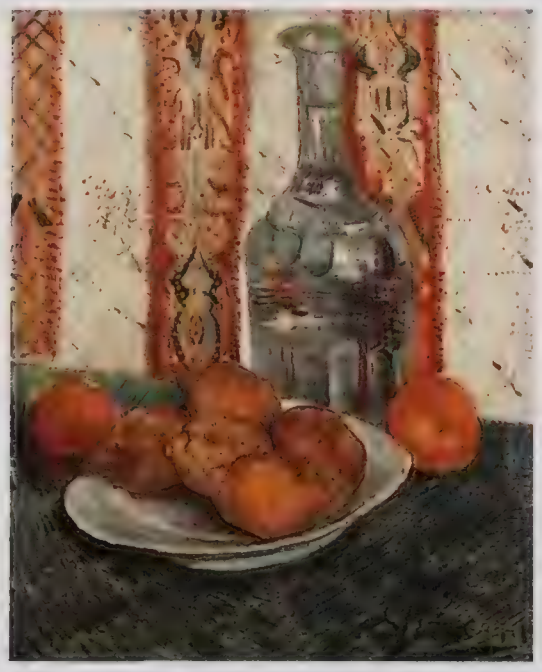
VAN GOGH'S

BY CONSTANCE BOND

JUST 11 DECADES AGO, IN 1888, THE TOWNSFOLK OF ARLES IN SOUTHERN France were getting used to the lone Dutch artist who had come there in February to live and paint. In the spring, they watched him carry his painting equipment out to the blossoming orchards, tying the legs of his easel to pegs driven into the ground so he could continue to work in the viciously blowing mistral. And they watched as, late one evening, he painted in town under the starry sky, candles attached to his easel to provide illumination.

His clothes were somewhat shabby, and he ate dinner on the cheap at a café down the street from where he lived. The locals weren't sure how to pronounce his last name. Those few in Arles who befriended him—in particular the postman, Roulin—knew that Vincent van Gogh, this intense thirty-something man with bad teeth, received money and supplies from his brother Theo, a struggling art dealer in Paris, and that in return the artist sent to Theo his paintings and drawings, and long letters written in the evenings after he finished working.



Vincent van Gogh's career as a painter lasted only ten years. *Self-Portrait with Straw Hat* (right) and *Still Life with Carafe and Lemons* are both from 1887.

Later, after both brothers died tragically young, it would be Theo's young widow, Johanna, who would keep the paintings and the letters. She opened a boardinghouse, filled it with the paintings and edited the letters; it made her feel closer to her husband, she said. The letters were published. The works of art are now housed in the Van Gogh Museum in Amsterdam. Currently undergoing renovation and expansion, the museum has sent to the United States a collection of 70 of the paintings that were in Johanna's safekeeping; they date from 1882, when Van Gogh lived in The Hague, to 1890, the year he died. Opening at the National Gallery of Art in Washington, D.C. (October 4, 1998-January 3, 1999), where it is sponsored by Andersen Consulting, "Van Gogh's Van Goghs: Masterpieces from the Van Gogh Museum, Amsterdam" will later visit the Los Angeles County Museum of Art (January 17-April 4, 1999). A handsome catalogue distributed by Harry N. Abrams will accompany the show.

More than a dozen works in the exhibition date from 1888, that pivotal year for Van Gogh. Paul Gauguin had agreed to come to Arles to live and paint with him, and as he furnished the modest house he had rented with chairs, nightstands and his own paintings in anticipation of his friend's arrival, Van Gogh dreamed that this would be

ALL: VAN GOGH MUSEUM, AMSTERDAM (VINCENT VAN GOGH FOUNDATION)

VAN GOGHS

the beginning of a great art colony.

And Van Gogh surely was due a turn of luck; his life had been one of almost unrelenting struggle (SMITHSONIAN, October 1984). He was born, in 1853, into a family of limited means, his father a preacher, his uncles art dealers. But relations were always strained. The idea of "conventions," whether in life or in art, didn't register with him. By the time he moved to Arles early in 1888, he had already knocked around Paris, London, Brussels and other towns farther off the beaten track—losing an early job with the art dealer Goupil et Cie., teaching school for a while, preaching in a coal-mining community, studying art in Brussels but not staying for long. Finally, at age 28, he found his bearings, and with his brother's financial support he took painting lessons in The Hague.

His relationships with women, or attempts at them, were as ill-starred as his early stabs at a career. He fell hard for a landlady's daughter and, later, for a much older cousin; both rejected him. In The Hague, he lived contentedly for a while with a prostitute. They camped in the dunes at the nearby beach "as real Bohemians," he wrote Theo. (On a stormy day he returned with his easel, working amid swirling sand that, to his annoyance, lodged in the paint.) But that relationship disintegrated in the cold light of reality. On the one hand, he felt himself to be of a feather with the peasants and laborers he chose to live among and paint; on the other, he was frequently lonely for someone with whom he could discuss books and art, which is what he so desperately hoped Gauguin's arrival in Arles would bring.

But within two months the dream was shattered, and what happened has become the stuff of tragic legend: the arguments; Van Gogh's act of self-mutilation, as he cut off part of his own ear; Gauguin's hasty departure; Van Gogh's recurring struggle with mental illness.

In July 1890, Van Gogh shot himself in the chest. He lived for two days. He spent his last day in bed, smoking his pipe, comforted by his brother. Six months after Vincent's death, Theo died also.

The earliest painting in the exhibition is the sand-impregnated work from 1882, *Scheveningen Beach in Stormy Weather*. Three years later, his palette still earth-toned, Van Gogh created his early masterpiece *The Potato Eaters*, in which a young girl witnesses the gentle act of her elders at the table sharing potatoes they have dug from the ground. Once Van Gogh discovered the Impressionists, his paintings—from his compelling self-portraits to late works such as *Landscape at Twilight* (pp. 71-73), painted only a month before he died—exploded with color, laid onto the canvas in thick, assertive, emotion-laden brushstrokes. Other works, notably *The Courtesan* (p. 70) from 1887, bespeak Van Gogh's fascination with the bold, flat color and outlined figures of Japanese prints.

Overall, this exhibition provides a stunning survey of the artist's short lifetime of painting. When the Van Gogh Museum reopens late in 1999, it will mount a show devoted to the relationship between Vincent and Theo. That exhibition will require a trip to Amsterdam, but chances are that after seeing "Van Gogh's Van Goghs," a lot more Americans will be likely to make the pilgrimage.

The author is a contributing editor to SMITHSONIAN. *She wrote on posters in April.*

His rented yellow house in Arles was a "frightfully difficult" subject, Van Gogh wrote to his brother Theo in 1888, adding, "but that is just why I want to conquer it."

Van Gogh painted *Fishing Boats on the Beach at Saintes-Maries-de-la-Mer* (1888) in his studio from a drawing done earlier. The boats, he said, were "so beautiful in form and color that they remind one of flowers."

The linear patterns of tangled foliage in *Butterflies and Poppies* (above), painted in the spring of 1890, reflect the influence of Japanese prints, which fascinated Van Gogh. The vivid colors of the artist's late works are in marked contrast to the earthy palette of earlier paintings, such as *A Pair of Shoes* (below) from 1885.

"Portraiture is the only thing in painting that moves me to the depths, and it makes me feel closer to infinity than anything else," Van Gogh wrote in 1888, a few months before painting the portrait of his postman's son, Camille Roulin (above). The artist would do portraits of the entire Roulin family, who befriended him during his sojourn in Arles. At right, the town's skyline merges with the trees in *Field with Flowers near Arles*, also from 1888. "I am getting an eye for this kind of country," Van Gogh told Theo.

In early 1890 Theo Van Gogh's only child was born, and named Vincent Willem after his uncle. On hearing the news, the artist, who was living in a mental hospital in Saint-Rémy, painted "large branches of almond blossoms against a blue sky" as a gift for his brother and his wife. *Almond Blossom*, Van Gogh would write, "is perhaps the best, the most patiently worked thing I had done, painted with calm and with a greater firmness of touch."

Van Gogh's great interest in Japanese prints—"I envy the Japanese the extreme clearness which everything has in their work," he would tell Theo—is apparent in *The Courtesan* (right) from 1887, which he painted after tracing and adapting a print by Keisai Eisen that had been featured on the cover of *Paris Illustré*.

OVERLEAF: Two pear trees dance against a yellow sky in *Landscape at Twilight*, painted in June 1890. The artist was living in Auvers, France, an artists' colony outside Paris—the town's 17th-century chateau is visible at the center of the painting. "I still love art and life very much . . . I apply myself to my canvases with all my mind . . . ," he wrote Theo. "Well, my own work, I am risking my life for it and my reason has half-foundered." On July 29, 1890, Vincent van Gogh died, a suicide.

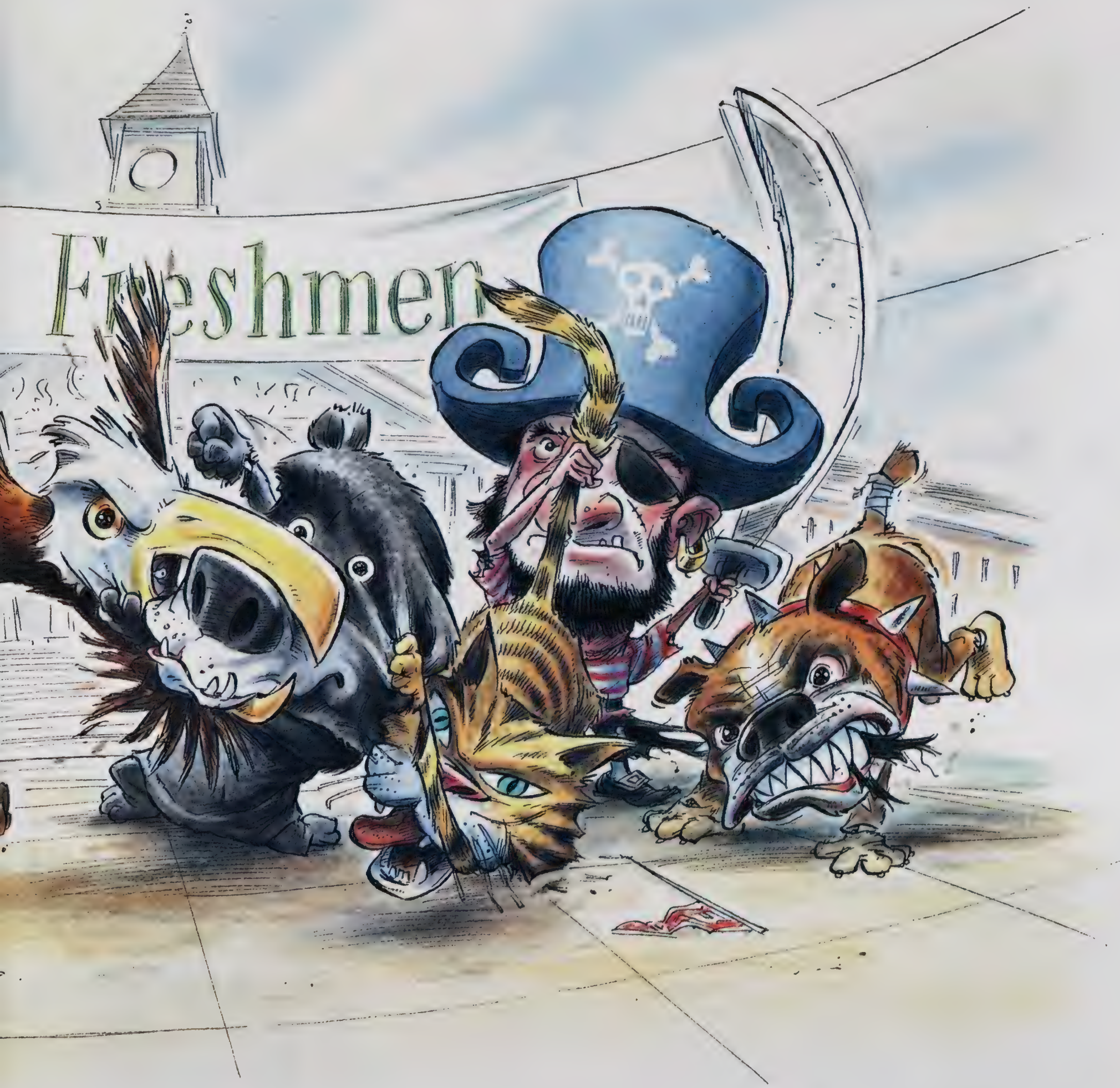
Rah, Rah, Ruffians!

IF SCHOOLS AIM TO BRING OUT THE BEST IN OUR YOUTH, WHY DO THEY NAME THEIR TEAMS AFTER BEASTS, BULLIES AND BUCCANEERS?

BY BIL GILBERT ⁘ ILLUSTRATIONS BY DANIEL VASCONCELLOS

THERE HAS BEEN MUCH talk of late about sportsmanship good and bad, the idea being to encourage the former and discourage the latter. It is unlikely that much progress is going to be made at the college and university level, however, until someone does something about those terrible names.

I'm referring to the nicknames, logos and mascots many of our 3,700-plus institutions of higher learning have chosen to represent themselves. Nearly half have selected animals, emphasizing traits—bloodthirstiness, viciousness and so forth—that cannot possibly improve the moral character of young men and women. The most popular beasts are the supposedly dangerous felines—tigers, lions, wildcats and such—who denote more than 200 schools. They are closely followed by flocks of hunting or scavenging birds; packs of wolves and reputedly ferocious breeds of domestic dogs (among them more than 40 bulldogs); bears and members of the weasel and Mustelidae family (six wolverines and three badgers) who have especially nasty reputations. There are also many teams named after hoofed beasts so powerful and unruly that they are usually found only in wild or well-fenced places because of the personal or property damage they can cause in settlements. In this Thundering Herd (Marshall University, Huntington, West Vir-



ginia) are Bison, Bulls, Rams, Razorbacks, Mustangs and a Mastodon (Indiana University-Purdue University, Fort Wayne, Indiana).

Cold-blooded fauna are represented, athletically, by multiple Gators, Cobras, Rattlers and a Gila Monster (Eastern Arizona College, Thatcher, Arizona). About 50 academic institutions are affiliated with swarms of hornets, wasps and yellow jackets. Except for the Terrapins (University of Maryland, College Park, Maryland) and perhaps the Horned Frogs (Texas Christian University, Fort Worth, Texas), creatures in these categories are ones that in real life people would avoid like poison, as in fact some of them are.

The humanoid totems adopted by 500 or so colleges and universities are potentially more dangerous than the animals. Misguided youths may come to admire the reputed ferocity of, say, a Wolverine (Grove City College, Grove City, Pennsylvania) but cannot actually behave like one, as they might in the case of the Savages (Southeastern Oklahoma State University, Durant, Oklahoma). Good productive people used as collegiate symbols are vastly outnumbered by mean, violent thugs and rascals. Shockingly, there are more than 40 Buccaneers, Corsairs and Pirates. There is even a Keelhauler (California State University-Maritime Academy, Vallejo, California). Closely allied are 30-odd Vikings. These berserks were

Scottsdale Community College in Arizona picked the Artichokes as its team name.

professional killers, arsonists, pillagers, rapists and often very disagreeable drunks. Representing several accredited institutions along with these sea goons is a virtual regiment of Knights, Lancers, Marauders, Musketeers, Raiders, Swordsmen, Spartans, Tartars and other paramilitary bullies, robbers and terrorists. It's true that some may have been dupes and mercenaries of wicked masters, but none of this bloody gang should be advertised to youths as dashing heroes.

Less dangerous but still violent and disruptive are the ordinary brawlers with whom some otherwise reputable schools have seen fit to associate themselves. Perhaps the most prominent are the Fighting Illini and the Fighting Irish, but this pair would probably get the stuffing kicked out of them by the several collegiate Fighting Scots. The Ragin' Cajuns (University of Southwestern Louisiana, Lafayette, Louisiana) would no doubt give a good account of themselves in any such melee. More disturbing in regards to domestic tranquillity are two Battling Bishops (North Carolina Wesleyan College, Rocky Mount, North Carolina, and Ohio Wesleyan University, Delaware, Ohio); the Fighting Parsons (Nyack College, Nyack, New York) and the Fightin' Christians (Elon College, Elon College, North Carolina).

Some worry nowadays about the spread of satanic influences. The most obvious sources of this unholy promotion are the 20-odd colleges and universities that blatantly represent themselves, athletically, as Devils, including a number of Blue and Red ones. The others are colorless and of restricted distribution—for example, the Delta Devils (Mississippi Valley State University, Itta Bena, Mississippi). For evil measure there are also a half-dozen Demons, and the Trolls (Trinity Christian College, Palos Heights, Illinois).

Many schools chose their nicknames before they had female athletes. A few adjusted to the new era with good sense and grace.

Clearly, character building is not a top priority for educators who send out their athletes as princes and princesses of darkness—as the Scalping Braves and Ladybraves (Alcorn State University, Lorman, Mississippi) or the Vandals (University of Idaho, Moscow, Idaho).

And what of the impressionable students? One must consider the impact of some names on behavior. It must be difficult to establish honor codes and prevent cribbing and plagiarism when students are encouraged to root for sneaks and cheats, such as the Claim Jumpers (Columbia College, Sonora, California), Land Sharks (Landmark College, Putney, Vermont), Rustlers (Central Wyoming College, Riverton, Wyoming) and Sooners (University of Oklahoma, Norman, Oklahoma).

Many colleges and universities chose their nicknames, logos and mascots before they had female athletes and teams. A few adjusted to the post-Title IX era with good sense and grace. To be commended are, for example, the Anchormen and Anchorwomen (Rhode Island College, Providence, Rhode Island), Gentlemen and Ladies (Centenary College, Shreveport, Louisiana) and Lords and Ladies (Kenyon College, Gambier, Ohio). The Trojans and Women of Troy (University of Southern California, Los Angeles, California) and the Yeomen and Yeowomen (Oberlin College, Oberlin, Ohio) may cause some merriment but are honest efforts. The most creative and/or surreal are the Lights and Sky-

The University of Southern California plays as the Trojans and Women of Troy.

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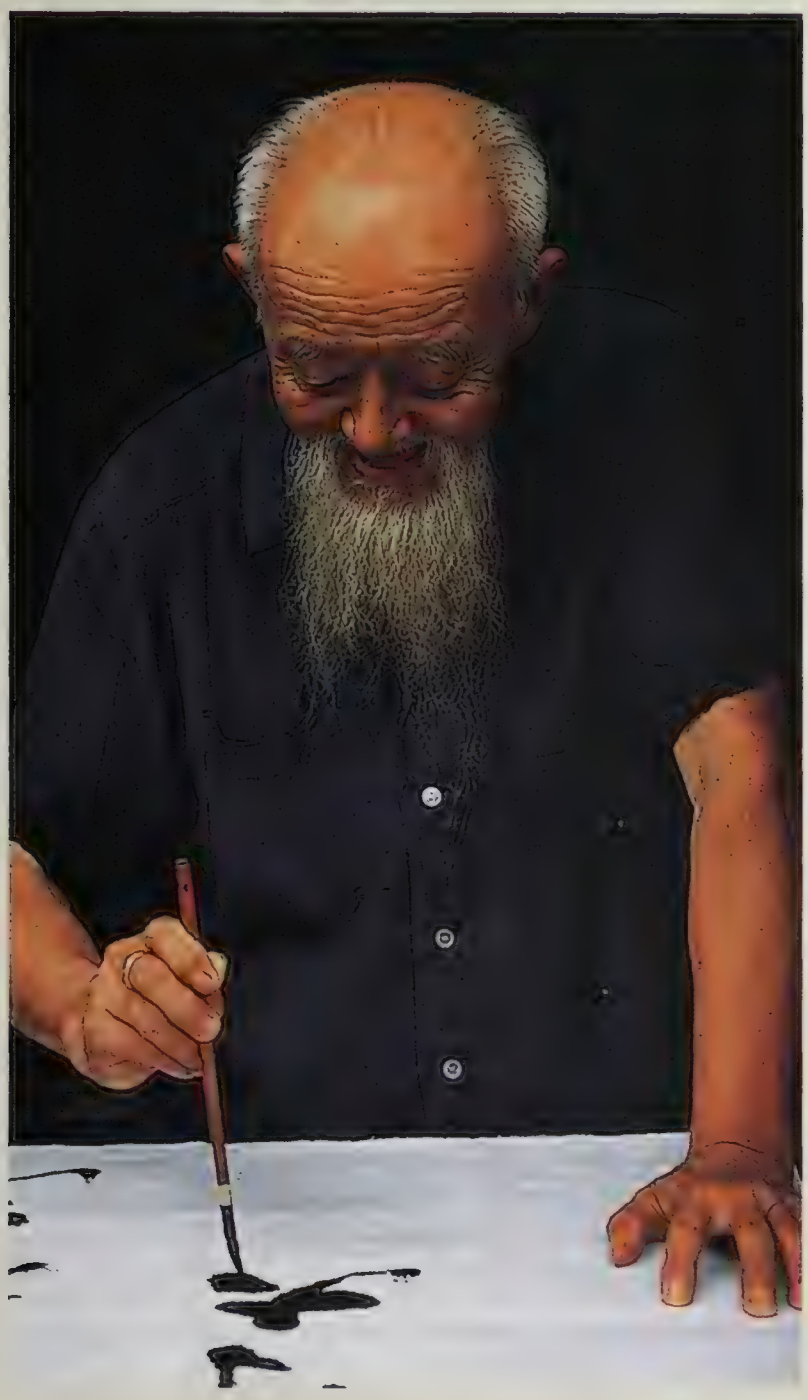

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lights (Montana State University-Northern, Havre, Montana). For reasons of tradition and local usage the several Cowboys and Cowgirls may be acceptable, but definitely not are the Lumberjacks and Lumberjills (Northland College, Ashland, Wisconsin), Vikings and Vi Queens (Augustana College, Rock Island, Illinois), Wildcats and Kittens (Wiley College, Marshall, Texas).

It appears that no teams currently in action are named after cows, ewes, mares or sows. But a goodly number of schools have done much worse by identifying their sportswomen with unnatural creatures: Lady Rams, for example, or the equally unlikely Lady Barons, Lady Dons, Lady Knights and Lady Lumberjacks.

Good people used as collegiate symbols are vastly outnumbered by thugs and rascals.

Existing athletic governing bodies have amply demonstrated that they lack the will and/or wit to deal effectively with these grave concerns. As to who might: a new federal Nomenclature Regulatory Agency (NRA) seems necessary. As a first step the NRA should scientifically examine the behavioral impact of all current sporting names, logos and mascots. Those certified as being beneficial or at least value-neutral may be retained. Substandard institutions and franchises could be given a year to select replacements from among several approved categories.

Trees, for example, are big, distinguished, durable beings that can provide a forest full of classy monikers. Presently this resource is being exploited only by a relative few: the Buckeyes (Ohio State University, Columbus, Ohio), the Maple Leafs (Goshen College, Goshen, Indiana), the Oaks (Menlo College, Atherton, California) and the Sycamores (Indiana State University, Terre Haute, Indiana). In one fell swoop most of those disgusting Blue Devils and Red Devils could be undone by requiring them to become Blue Spruces and Red Maples.

Foodstuffs could also provide yeasty names. Why not transform the Scalping Braves and Ladybraves of Alcorn into the Breads? Other improvements would be: the Alaska Bakes, Boston Cream Pies, Charlotte Russes, Idaho Potatoes, Kentucky Fried Chickens, Louisiana Po' Boys, Rice Pilafs, Vermont Syrups, Virginia Hams, Wisconsin Cheddars and Worcester State Sauces.

Actually, there's one Arizona school that's far ahead of the pack in this regard. For teams with heart, nobody beats the Scottsdale Community College Artichokes.

Over the years, Bil Gilbert has written 27 stories for SMITHSONIAN. *He lives in Pennsylvania. Daniel Vasconcellos, a native of Massachusetts, plays on an ice-hockey team called the Fightin' MeatBirds.*

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TERMITES ARE COVERT DESTROYERS. YOU DON'T HEAR THEM OR SEE THEM UNTIL THEY COME SWARMING OUT OF THE WOODWORK ON THEIR SPECTACULAR MATING FLIGHT

BY RICHARD CONNIFF

AT DUSK ON JACKSON SQUARE, IN THE heart of the French Quarter, Lola sits at her folding table waiting to read palms. A tall bearded man in leather and silver jewelry jangles past, and a pale woman in a Clara Bow haircut ghosts through the shadows. The chimney swifts swoop like bats above the steeples and lace balconies of the square, chittering with anticipation: tonight, or maybe tomorrow, a spectacular mass mating ritual will take place on the streets of New Orleans.

But there will be no joy in the Big Easy. Sybarites will react instead with horror and dismay. Foot traffic will stop. Restaurants will close their patios and slam their doors. Baseball games will be canceled. Bourbon Street will go dark. The scandalous event is the Mardi Gras of the Formosan termites, a mating flight in which insects by the gazillion fill the moist air seeking love. On certain evenings in May and June, the termites come seething out of the woodwork and trees in such tropical profusion

Below: Magnified 70 times, a subterranean worker termite takes three mites for a ride. The segmented "arms" are actually antennae. Opposite: Formosan termite alates congregate against the window of a building in New Orleans.

that it can be difficult for a person to breathe, or for a driver to see halfway across the street. The alates, as the winged termites are called, are frail creatures, a third of an inch long, fluttering weakly on their dull, diaphanous wings. They have only a few hours to find a mate and set up house together. More than 99 percent of them will fail, getting eaten by the chimney swifts, or piling up like dead leaves in the corners. And yet they induce fear.

The termites swarm toward light, even a television set kept on by people huddled in their darkened apartments with the doors and windows shut. "Any house with cracks, if you have the lights on, they start coming in," says Marc Cooper, director of the Vieux Carré Commission, which oversees architectural preservation in the French Quarter, "and all the houses down here have cracks." The alates get caught in peoples' hair and fall into their food. They crawl under collars and creep across bedsheets.

But the real fear is that a few of the termites out flying on this night will succeed: they will find mates and settle down to reproduce behind the bathroom wall or any other moist interior surface. They will set up housekeeping in some perfectly restored Italianate town house on Royal Street, or in a double shotgun cottage on St. Peter Street, where they can do enough damage to bankrupt the unsuspecting owner or drive a family to divorce. Formosan termites, from China, were introduced into this country only about 50 years ago and are one of the most destructive species in the world. "There is this psychological terror they impart" on that swarming night, Cooper says, "because we know this is part of the life cycle of a creature that is eating our homes."

Ed Bordes, the director of New Orleans' termite-control agency, displays a section from the riddled trunk of an infested palm tree found growing in a Jackson Square courtyard.

When I first heard about the Termite That Ate New Orleans, I happened to be in the middle of building my own termite food court—a new wood-frame house on the coast of Connecticut—and it seemed like a good time to find out more about the enemy. I follow entomological news the way other people read the sports section or the funnies, and what I knew about termites was a grab bag of distinctly odd facts clipped out of newspapers over the years. I knew, for instance, that there are about a thousand pounds of termites for every man, woman and child on earth, and that the termite biomass in some parts of Australia outweighs the kangaroos'. I knew that up to 30 percent of the gases implicated in global warming may actually come from termite flatulence (I just wasn't quite sure why). I also knew that different termite species have evolved soldiers of wonderfully bizarre form: for instance, one type of soldier has a nozzle-like appendage on its head that sprays sticky gunk on ants, which are a common enemy of all termites. Other types have mandibles that work like baseball bats, popping ants out into short center field. I knew that, despite their reputation for destruction, termites are among the most formidable builders in the animal kingdom—and that what we call destruction is actually, seen from a larger perspective, recycling. If termites weren't out there breaking down dead trees, and other plant material, and returning nutrients to the soil, new trees could not live, nor could we.

"As homeowners we tend to think of termites as pests," writes David Nickle, a U.S. Department of Agriculture entomologist at the Smithsonian, "but termites really are one of the most beneficial groups of insects on earth." So I decided to learn more about termites, mapping out an itinerary that included stops in New Orleans and in Africa, where I'd previously seen mounds twice my height built by termites weighing less than a thousandth of an ounce.

With termites, keeping a hold on the larger perspective can of course be a struggle—for instance, when you are stuck with 38 children in a classroom full of swarming alates at the Dr.

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Charles R. Drew Elementary School in New Orleans. In Monica Wilson-Leary's fifth-grade class, the termites have eaten wormy holes through the wood-backed blackboard, and she no longer posts her students' work on the corkboard overhead because termites will critique it one bite at a time. A month ago, she put up a strip of orange paper as a decorative border, but it is already buckled and swollen from the steady tunneling underneath. Sometimes it undulates faintly. In the corners of the room, the hardwood floors are shredded to papery strips. Wilson-Leary has gotten in the habit of sweeping dead termites off her desk every morning in swarming season. But she says her students won't work when the alates start to fly.

Outside, Gregg Henderson of the Louisiana State University Agricultural Center is drilling holes in the dirt around the perimeter of the building and burying monitors—rolls of corrugated cardboard in containers the size of a soda can—to measure how bad the termite problem is. Later, exterminators will set out baits laced with newfangled poisons, including one that prevents the termites from molting and another that inhibits their cells from using energy. Then Henderson's crew will continue monitoring to see how many termites survive and how quickly they come back. The aim is to find the best poison for controlling Formosan termites in the absence of chlordane, a potent termite-killer that was banned in 1988 because it accumulates in the flesh of higher organisms, including humans.

It is a daunting challenge. Henderson says that since 1989, when

Right: A New Orleans fumigator emerges from a building with infestations like the one a homeowner discovered last summer. Above: Alates swirl around a streetlamp.

SCOTT THRELKELD/TIMES-PICAYUNE; G. ANDREW BOYD/TIMES-PICAYUNE (2)

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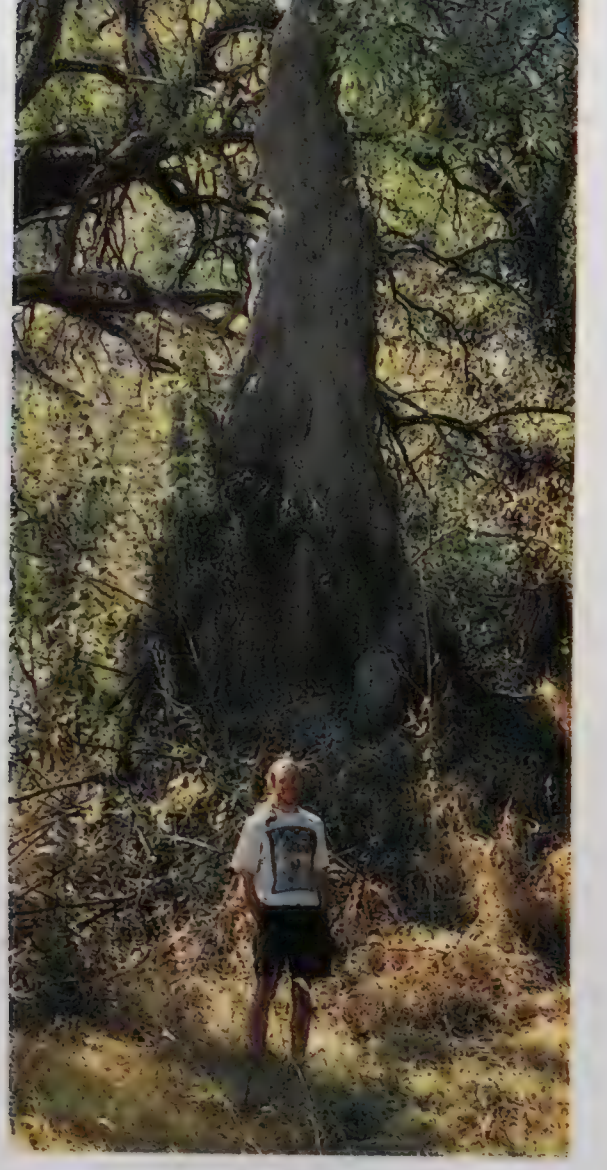


Top: Termite mounds stud the arid ground on the tablelands of northern Australia. Above: Researcher Gregor Schuurman sizes up a trophy mound he found in Botswana.

researchers first started monitoring the mating flights in New Orleans, the annual catch of alates has increased 3,600 percent. Sometimes a single trap the size of an ordinary household bucket will catch 15,000 alates in a night. It is possible that the increase means that the Formosan termite population has reached a critical mass. According to Henderson, if a male and a female find each other on their mating flight and crawl off into wedded bliss, it may take them seven years before their colony is large enough to produce its own alates. But after that, the colony can grow at an exponential rate. Just across the river in the Algiers neighborhood, a colony of 60 million individuals blossomed in the walls of the public library.

Thus it has occurred to some people that the Formosan termites, having likely arrived here packed up with World War II military surplus and having slowly established a beachhead, might now be on the verge of a breakout. Formosan termites already occur from Louisiana to the Carolinas, and also in Hawaii and California. Some researchers have speculated that with the help of central heating, they could spread as far north as Boston, Chicago and Oregon. That possibility (and the fact that the chairman of the House Appropriations Committee comes from New Orleans) recently prompted Congress to give the U.S. Department of Agriculture $5 million for improvement of termite controls.

They have a bleak saying in New Orleans, but it's true for much of the rest of the world, too, especially in warmer climates: there are really only two kinds of houses—the ones that have termites, and the ones that will have termites. In the United States alone, these pests cost an estimated $1 billion to $2 billion a year in damage, prevention and control—less than fires or floods, to be sure, but a disaster nonetheless.

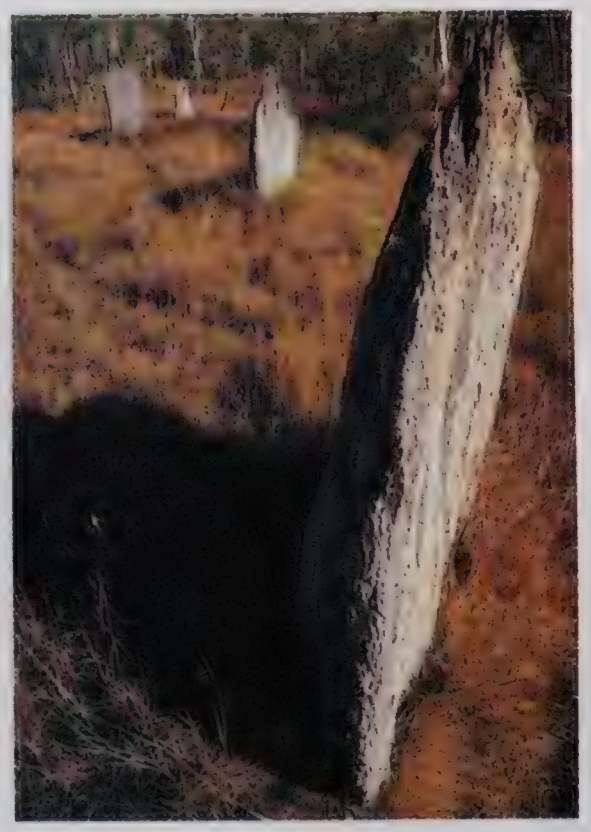
Termites generally have an aversion to open air, so, except for their annual mating flight, the signs of invasion are almost always subtle. Subterranean termites build mud tubes up the house foundation, to get back and forth between their food and the nest. But unless a homeowner happens to be awfully zealous with the weedwhacker, these tubes are easy to overlook. Drywood termites actually nest inside the wood itself, sealing themselves off from the outside world to do their dirty work; they even man-

BILL SCHUURMAN; PP. 88,89 BILL BACHMAN/PHOTO RESEARCHERS

age to "drink" water out of old wood. They intermittently open "kickout holes" to heave out their fecal pellets. But few homeowners recognize the source of the telltale grit scattered on nearby floors—even when they slip on it and land flat on their backs, staring up at the woodwork in which the termites have once again sealed themselves snugly away. (Some drywood termite soldiers have heads like drain plugs, to block up the kickout holes.) Another sign of invasion, also easily missed, is the faint clicking sound produced by some termites. Europeans used to believe this sound was a harbinger of death in the house, which one expert thinks is how termites got their name, from the Greek word *terma,* or "the end." But more often than not, termites go unheard and unsuspected.

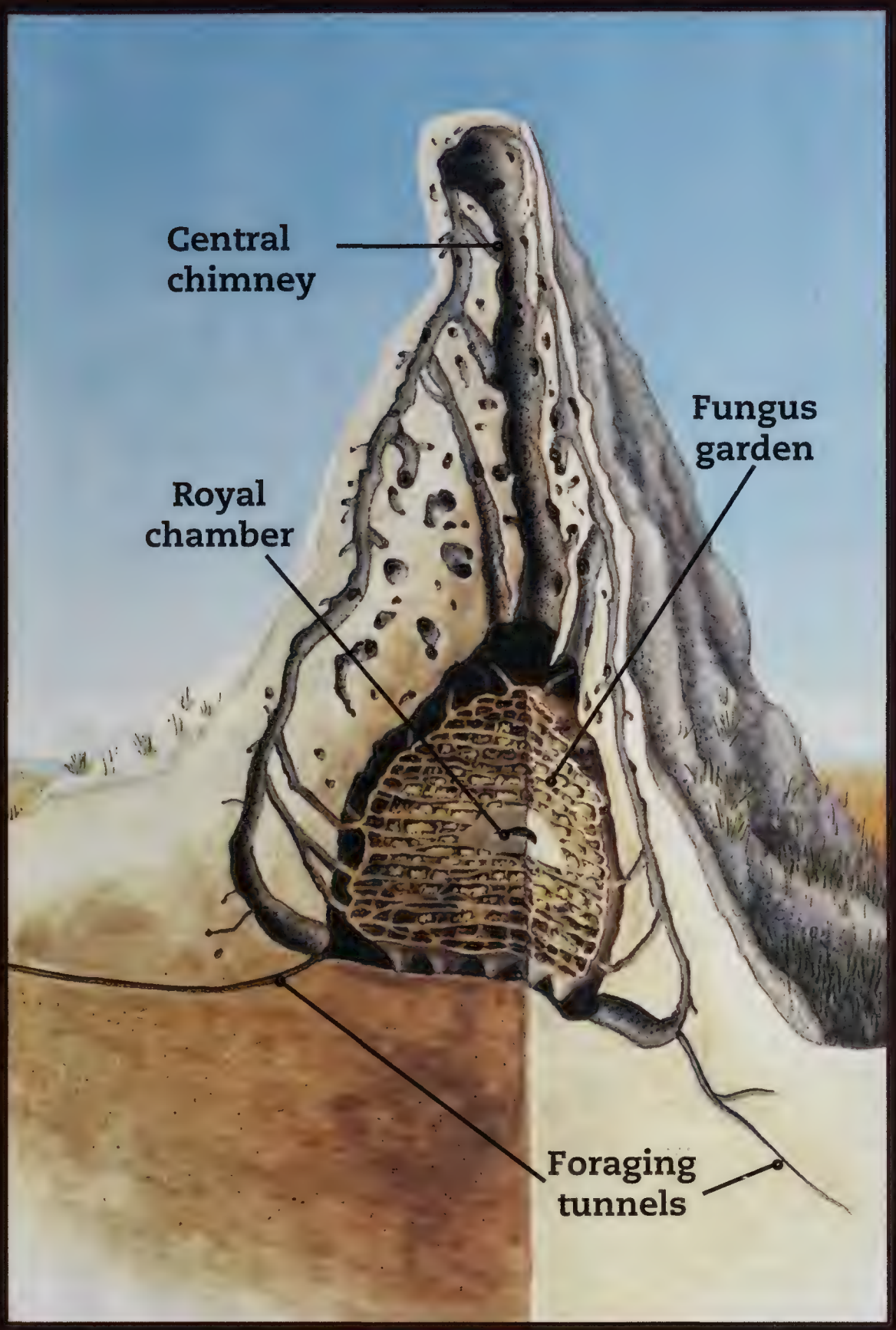
There is something treacherous about it, like a cancer spreading beneath healthy skin. Termites are masters of the false front. To protect themselves from the open air, they leave the surface of whatever they eat intact—until the chair legs collapse, or the joists buckle or, as happened to a New Orleans homeowner, all four legs of the grand piano plunge through the floor. Moreover, when the surface finally crumbles to reveal the corruption underneath, termites are also ugly, with their maggot-pale abdomens dragging listlessly behind them. The normal human impulse is to reach for the nearest deadly aerosol and kill everything in sight. But even killing a million termites may not solve the problem, which is why it helps to understand termite biology.

Early writers sometimes mistakenly described termites as "white ants," perhaps to make them seem more appealing. Like ants, termites have an elaborate social structure in which a few individuals do the reproducing and the rest serve the colony by tending juveniles, gathering food, building the nest or battling off intruders. Termites evolved more than 140 million years ago from an ancestral species that also gave rise to the cockroaches, and they still share many physical traits with cockroaches. But they somehow also developed the highly cooperative social traits similar to those of ants, bees and other hyme-



Above: The mushroom shape of a mound in Cameroon provides shade, sheds rain. Right: The so-called magnetic mounds in Australia have a north-south orientation.

VICTOR ENGLEBERT/PHOTO RESEARCHERS; GERRY ELLIS/ENP IMAGES



The cutaway illustration of a seven-foot-tall termite mound shows a system of chimneys extending up from the base. Tunnels for foraging radiate outward. The comb-like structure at the base, the fungus garden, surrounds the royal chamber. Above left: Workers tend the fungus garden. Above right: The queen is served.

nopterans, to which they are only distantly related. This social system—sometimes described as the first civilization on earth—is the key to understanding termite behavior.

To evolutionary thinkers, it makes sense that ant workers give up their own reproductive potential, and even their lives, for the good of the colony. Because of a quirk in the way the queen ant reproduces, worker ants are closer to their siblings, who share on average three-quarters of their genes, than they would be to their own offspring, who would have only half their genes. So becoming sterile workers and laying down their lives for their sisters may in fact be the best way to transmit their genetic heritage. But the same reproductive quirk does not occur in termites; genetically, their offspring are as good an investment as their siblings. And yet most termites also give up the chance to reproduce, and termite soldiers routinely defend the colony with their lives. In one spectacular display of self-sacrifice, the soldiers of a termite species swell up their abdomens till they explode, spattering their guts all over any adversary that threatens the colony.

To scientists, this constitutes highly social behavior, and there are many theories about how termites got it. Society probably first appeared among primitive termites living in dead trees. In Barbara Thorne's laboratory at the University of Maryland, each of 500 clear plastic containers the size of a cake pan holds an entire colony of primitive dampwood termites, living out their lives in a chunk of wood. "It's like looking at a 'dinosaur' termite," Thorne says. "They are among the most primitive living termites. They spend their entire life cycle in the wood. They don't go off foraging, like many other termites." Thorne theorizes that primitive termites like these lived slow, isolated lives snug in their food

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source. The breeding pair, or king and queen, were monogamous, like modern termites, and did all the reproduction in the colony. Their offspring were capable of developing into alates, flying away, and becoming kings or queens in their own colonies. But because cellulose is low in nutrients, it took them months to reach maturity. This meant that older siblings were still in the nest, available to help feed and groom their juniors.

Hook-like mandibles at the ready, a tropical soldier termite assumes a defensive stance as an ant approaches. The dark, knife-like object on its head squirts a chemical deterrent.

Helping with brood care was the crucial first step in becoming a family and then a society.

Food sharing is of course commonplace in animal societies. Foraging ants, for example, bring back food and regurgitate for their nestmates, who regurgitate in turn for other nestmates, until everyone in the colony is fed. But termites take this communal feast a startling step further: they share food from both ends of the digestive tract. One can just imagine an appalled termite parent catching the youngsters at this unsanitary practice and declaring that they had better have a damned good explanation. And in fact they do: the "hindgut fluids," as scientists delicately call them, contain intestinal protozoa and bacteria that have evolved with the termites to help them digest dead wood. Plant cellulose is extremely high in carbon and low in the nitrogen animals need to build cells. The protozoa and bacteria help burn off the excess carbon (incidentally producing greenhouse gases) and concentrate the nitrogen. Passing these fellow travelers on to each new generation is one of the vital functions of termite society. Some scientists suggest it is the reason termites developed a society in the first place.

In the course of evolution, the hindgut fluids also became one way for the termites to pass on pheromones, or chemical messages, vital to regulating the life of the colony. One of these chemical messages, called juvenile hormone, is produced by the queen to suppress sexual development in some of her offspring and keep them around the house as helpers, usually for their entire life span of perhaps one or two years. Other chemical messages cause some workers to transform themselves permanently into soldiers, equipped with big, thick heads to wield heavy weaponry. The workers and soldiers also contribute their own pheromones to regulate their ranks. Other chemical messages control behavior. For instance, foragers who find food lay down a trail pheromone so their nestmates can find it, too. Every individual is part of a sophisticated biochemical feedback loop for meeting the needs of the colony.

Scientists don't yet understand what triggers the colony to produce its annual flight of alates. As the process begins, a large number of soldiers becomes apparent in the nest. Henderson theorizes that some of the soldiers sponge up the queen's juvenile hormone, allowing one crop of her offspring to escape the usual chemical sterilization and become alates. Guarded by soldiers and sometimes actually shoved out of the nest by their nonbreeding siblings, these alates fly away to propagate the colony—or die.

Having evolved social castes to handle different chores around the nest and the intestinal microbes to exploit one of the most abundant but indigestible materials on earth, dead wood, termites made one other evolutionary leap: instead of living in small groups within the narrow confines of their food source, they begin to form more populous colonies and build elaborate nests, becoming the most prodigious engineers in the animal kingdom. The nests of some termite species contain perfect arches, or

SARAH LANDEN PICTURES

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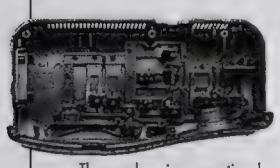

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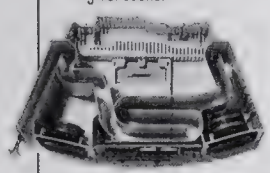

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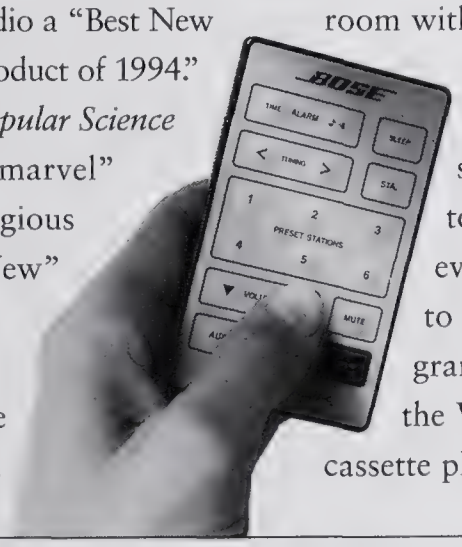

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spiral staircases between levels, or even vent holes with gargoyle-like structures. Some species nesting in rain-forest trees build "umbrellas" overhead. Other species build mounds with a north-south orientation, apparently for better climate control. Such adaptations have enabled the 2,300 known termite species to nest on every continent except Antarctica, and to function not just as wood-feeders, but as eaters of soil, detritus, leaves, dry grass and just about any other form of cellulose.

The morning is cold and the sun has just started to lighten the African sky behind a distant line of acacia trees, when a termite researcher named Gregor Schuurman goes to work in Botswana's Okavango Delta. Termite mounds, built by the species *Macrotermes michaelseni*, stand all around the grassy floodplain like weird druidic monuments. Each one rises on a broad pyramidal base, then narrows into a finger of clay, slightly bent, as if beckoning to the sky. Schuurman, a 27-year-old doctoral candidate from the University of Minnesota, also looks a little druidic: tall, thin, with a goatee, and hair pulled back in a braided ponytail. He selects a 7-foot-tall termite mound, about average in this part of the delta (though 15-footers also sometimes occur). Then he swings a pick with a termite-nibbled handle and begins to cut out a pit at the base of the mound. A half hour later, the clean slice of a shovel blade exposes the first signs of the termite world within: sculpted tunnels, which the termites have carved out mouthful by mouthful, cementing the round walls into place with their saliva.

"They've got a network of tunnels radiating from this mound for 160 feet in any direction," says Schuurman, "which means they're covering an area of 80,000 square feet with a single mound," roughly the equivalent of two football fields. Aardwolves, aardvarks, pangolins and a few dozen other species would gladly eat the termite occupants, given the chance, but the tunnels enable the workers to reach every potential food source in their vast territory without ever traveling more than about five inches on the perilous surface. "They're blind. They're soft-bodied. They dry out," says Schuurman. "They're very vulnerable creatures." And yet they are master builders. In his book *Termites: A Study in Social Behaviour*, P. E. Howse writes that if termites were the size of humans, the largest *Macrotermes* mounds would be five miles wide at the base and a mile high, more than triple the height of our greatest skyscraper. It is an extraordinary effort, especially considering that the payoff hereabouts consists entirely of dead grass.

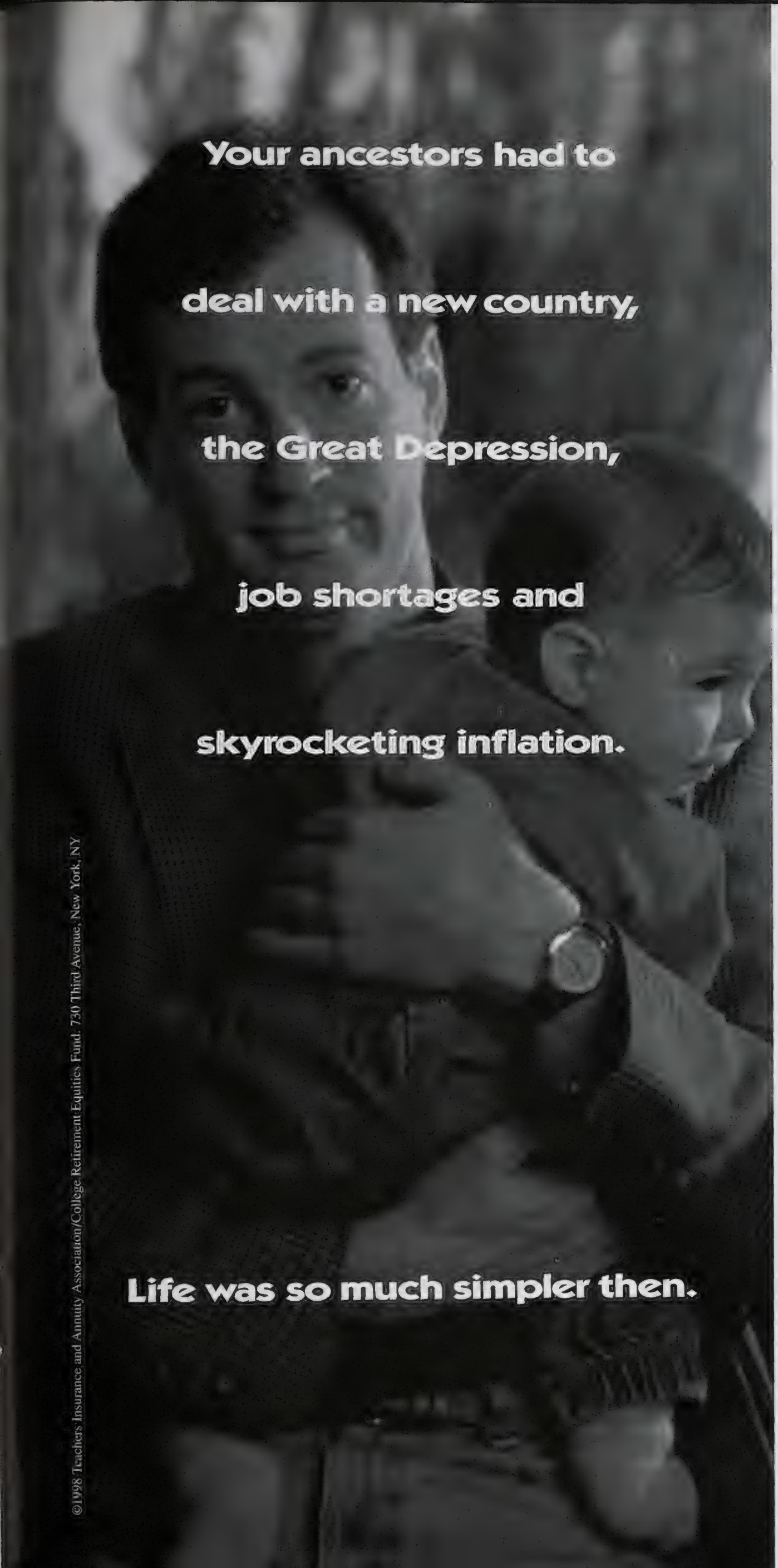
The tamandua digs up and eats termites from Mexico down to northern Argentina.

In the middle of the dry season, the grass is yellow and crackly underfoot. "You have to eat an awful lot of this stuff to get enough nitrogen to build tissue," says Schuurman. "So what this branch of termites has done is move the digestion outside their bodies. They use a fungus to help break down this grass, and it basically burns off a lot of the carbon, which comes out in the form of carbon dioxide."

Schuurman's digging sends up clouds of dust as the morning lengthens and turns hot. Up to now, the termites in this mound have mostly been fleeing well ahead of the calamitous intrusion of his pick and shovel. But gradually he exposes a great chamber under the center of the mound, and it's as if he's burst into the central assembly plant of the demented genius in some James Bond movie. Pale quarter-inch-long workers bustle everywhere, and soldiers a half-inch long, with big copper-colored heads and amber abdomens, charge out to defend the nest, snapping their curved mandibles to pinch the skin and drive off intruders.

Despite the defenders, Schuurman exposes the upper part of the central chamber, a half-dozen clay shelves, where orange, fibrous structures like honeycombs stand on stubby little feet. Having consumed grass at the perimeter of their territory, the worker termites come back and deposit fecal pellets on these combs, where the fungus does the work of digestion. Then the termites eat the fungus and their broken-down fecal pellets.

The chamber is a garden without sunlight. The whole purpose of the mound, Schuurman explains, is to create proper growing conditions for the fungus. Inside, it's like a rain forest in the middle of a savanna, 90 degrees Fahrenheit even in winter, 90 percent humidity even in the dry season. A complex system of chimneys runs up through the termite mound. (With a little modification, Schuurman once converted an abandoned mound into "the world's best pizza oven.") Until recently, researchers believed these chimneys enabled the mound to function mainly as a cooling tower, dissipat-



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ing heat produced as the fungus digests cellulose and burns off carbon. But new research by Scott Turner, a physiologist at the State University of New York, suggests that the mound plays only a minor role in regulating temperature. Turner discovered that air moves both up and down the chimneys with a kind of tidal motion, depending on wind and external temperature. This draws oxygen in through the surface of the mound and expels carbon, exchanging vital gases much as do our own lungs. Altogether, the mound, the social system that built it, and the symbiotic fungus enable termites to thrive on dead grass. In fact, they eat more grass than all the wildebeests, Cape buffalo and other savanna mammals put together.

Moreover, even this violent excavation will not threaten the survival of the nest. Aardvarks, says Schuurman, take minutes to do the kind of damage he has done in two hours of digging. They routinely raid termite mounds, and the termite colonies routinely recover.

We have not even come close to the real heart of the colony: the royal chamber, where the king and queen mate and produce their almost endless offspring, at a rate of 30,000 eggs a day. The royal chamber, says Schuurman, is "about the size of a pack of cards, which doesn't give the queen much room to move around." Not that she does much moving, anyway. To fulfill her reproductive duties, the queen has swollen to about the size of a human index finger. Eugene Marais, who wrote *The Soul of the White Ant*, describes her as "an unsightly wormlike bag of adiposity." The king maintains his youthful trim, never growing more than a half-inch long, but Marais happily adds that he nonetheless remains passionately faithful to his bride. The two of them pursue their wedded bliss in a chamber about 20 inches below the ground, which Schuurman describes as "a very thick lump of clayed earth, which has very few tunnels through it. It's a real sanctum sanctorum."

The queen may live for 15 to 20 years. When she dies, the pheromone that has kept most of her offspring sexually immature vanishes. One or more of her offspring may now become heirs to her throne.

Dwarf mongooses in South Africa stand watch atop a termite mound they occupy. The creatures are about nine inches long.

When a colony's long dynasty does come to an end, its abandoned mound may become home to another termite colony. Or, it may become a home for other animals, from black mambas to wild dogs, and slowly fade back into the earth. But the earth itself is altered by the passing of each termite mound. Because the mounds are rich in minerals and organic material, plants rapidly colonize them, sometimes forming raised islands of trees in grasslands. These islands may eventually grow together into continuous forest. Thus termites do not merely take forests down, piece by piece; they also build them up.

On one side of Jackson Square stands the Upper Pontalba, a National Historic Landmark, three stories high and a block long, with lacy wrought-iron balconies and windows shuttered on the inside. City officials have lately been boasting that here, in the heart of the war on Formosan termites, they have for once succeeded in exterminating the invader. But tonight up on the third floor of the Upper Pontalba, in one corner of a fine old apartment, moisture is seeping through the walls. The city's newfangled poisons have actually managed to kill a colony on the ground floor and in the trunk of an old tree out on Jackson Square, 300 feet away. But within the walls of that third-floor apartment, the termites have built satellites called mudpacks. Over time, these can become nests in their own right; now they are launch sites for this year's alates. The termite population has metastasized.

Termites have spent more than 100 million years refining their business of covertly feeding on wood, and it is hard to be too optimistic about our ability to stop them. Back home in Connecticut, I stop by to check on the progress of the house I am building and to let my house-proud eye play over all the handsome wooden details. And then I recall something I heard from a New Orleans schoolteacher. A crew had just laid down a new wood floor in her termite-riddled classroom. "Thank you," she said, on behalf of the tireless termite world beneath her feet. "You just gave 'em a free lunch."

Richard Conniff's book Spineless Wonders: Strange Tales from the Invertebrate World *is now available in paperback.*

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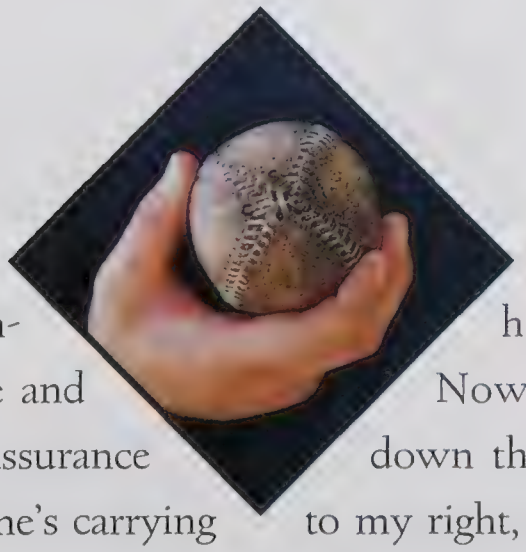
Charlie "Special K" Kouyoumdjian rocks back to pitch under the gaze of umpire Gary Monti. Inset: A homemade ball.

It's two, three, ***four*** ***strikes*** *you're out at*

The Old Ball Game



ED "PIGTAIL" ELMORE, A BALLIST FOR Brooklyn's Picked Nine, strides manfully to the plate. At six foot three and 200 pounds, he exhibits the cocky assurance of an accomplished athlete, even if he's carrying 40 more pounds into middle age than he had back in high school. Brooklyn's adversary in the match is the Long Island Picked Nine, in whose number, for the day, I count myself. On the field, I've been hiding in plain sight, defending third base without a glove. Our baseball contest is being waged by 1866 rules, with bare hands and a single hard, hand-sewn ball. For three innings, to my relief, the Brooklyn strikers have yet to test my fielding mettle. Now Pigtail smites a mighty wallop down the third-base line. Stepping smartly to my right, I reach down to grasp the hurtling ball. My autonomic nervous system, however, won't let me straighten my elbow sufficiently to make this possible. That's my writing hand—I *need* those fingers! The ball bounds into left field, and Brooklyn begins a five-run rally.

To most people, the idea of playing baseball without a glove probably sounds like canoeing without a paddle. At the Old Bethpage Village

BY DOUG STEWART

PHOTOGRAPHS BY DOUGLAS MERRIAM

Restoration in Old Bethpage, New York, however, it's the only sporting way to play. Vintage baseball is booming around the United States. At least 70 programs are fielding teams that play by rules of past eras, which range from 1845 to 1924; many such clubs have appeared just in the past five years. Biggest and most competitive of all is the Old Time Base Ball Program at Old Bethpage.

"Ours is the only program with full-blown leagues," says Ken Balcom, the museum village's assistant site director. Old-time baseball games have been played here since 1980 as one of the village's living-history demonstrations, like quilt-making and blacksmithing. The program got a boost four years ago when hundreds of baseball-hungry Long Islanders, disgusted that the major leagues' millionaires were out on strike, converged on Old Bethpage to watch or to play an older, purer game. Today the program involves 130 players, all

No matter what rules are being followed, the game does not continue till the ball is found. Handmade balls are too precious to waste.

volunteers, on ten teams in two leagues, over a 60-game season.

The 1866 league, with underhand pitching, is open to anyone with basic ability. Its 1887 counterpart is a faster, more hard-nosed game with overhand pitching and fixed rosters. Participants in both include a handful of

The Hicksville Ozones take on the Freeport Athletics in a game played by the rules of 1887. The pitcher is only 55 feet from home plate, instead of today's 60 feet, 6 inches.

women (dressed like the men) and range in age from 17 to 67. As it did in these parts a century ago, the baseball season climaxes this month at Old Bethpage's revived Long Island Fair. Amid band concerts and cornhusking bouts, the play-off games take place during the first two weekends, followed by the league championships on October 18.

"Sometimes during the fair when a ball game starts, everybody leaves," says Judy Campbell, an interpreter in 19th-century costume who works out of a tiny fisherman's cottage down a dirt road from the baseball diamond. "My mother and father will come from Hicksville to see me, but when the ball game's on, they say, 'We have to go now.' It's one of the biggest attractions in the village."

On a recent Saturday, I watch the first match of an 1880s doubleheader, the Westburys against the Glen Head Zig Zags. Dan "the Man" Moskowitz, 47, is the Zig Zags' bald, goateed, and very muscular cocaptain and pitcher. "My team is pretty much local guys, from the Glen Head area," Moskowitz tells me as his players shag flies before the game. The teams' names, like their uniforms and many of the players' nicknames, are copied from their 19th-century predecessors. Moskowitz himself dug up 1880s game accounts of the Zig Zags in the local newspaper archives. "They were known as a plucky bunch of ball-

players, very plucky," he says, "the equal of any nine in the area."

The ballpark at Old Bethpage (above) is nostalgia incarnate: a grass field, a wooden backstop, a vine-covered split-rail fence at the edge of the outfield, a red barn and gambrel-roofed house of 1840 vintage just beyond. Spectators begin gathering on rough wooden benches in the shade of an oak grove. "This is baseball in its purest form," Moskowitz tells me, waxing philosophical as baseball-history buffs do. "It's a window back into our youth, but also into America's past. It's a real counterpoint to the commercialism of modern-day baseball, where the focus is on marketing and skybox seats."

In keeping with the village's focus on living history, umpire Gary Monti, a professional historian, hands out typed lists of suggested period banter—"red hot" for a hard-hit ball, "what the blazes!" for "what the hell!"—which draw laughs from the rookies. "And no high fives," Monti warns. "Handshakes, that's it." A few of the players wear leather gardening gloves with the fingers cut off. Only the catchers wear baseball gloves, a concession to safety in the 1887 league. The players use modern-day wooden bats reshaped with slimmed-down barrels and flattened heads to resemble models from the 1800s.

As play gets under way, I recognize what I'm watching as baseball, but it has its oddities. Foul balls don't count as strikes, yet a foul tip to the catcher is an out, or a "hand down," even on the first pitch (a rule that inspires language from the batsmen that's not on the vocabulary list). A player is entitled to four strikes and five balls. Each time Monti intones "Strike four!" there are murmurs and laughter from spectators as they repeat the phrase.

The Westburys' fearsome pitcher, George "Wild Horse" Ferchland, 37, steps to the plate. The game is young, but Wild Horse already has dirt and grass stains on his broad chest, and the seam under one thick arm is ripped. Now he launches the ball on one bounce over the fence in center field and into a thicket. He pulls up at second as a pair of Zig Zags leap into the shrubbery to retrieve the ball. The play is dead. By 1866 rules, the ball would have remained in play, the runner circling the bases to "cross an ace" as the fielders bushwhacked. No matter what rules are being followed, the game doesn't continue till the ball is found. In Old Bethpage, it's one game, one ball: the handmade balls are too precious to waste.

Ferchland makes the balls himself, spending close to four hours wrapping yarn and stitching cowhide. On the bench later, he hands me a Wild Horse original. "I made my own pattern from an old ball I took apart," he says. The finished product is hard and round, though not quite as hard or round as a regulation baseball, and it's slightly larger.

The fans, sitting on the grass or on benches on the sidelines, are enjoying the show. "This is the game the way it should be played," says a man in a Yankees cap who's sworn off Yankee Stadium for good—"too expensive." An elderly Mets fan from Brooklyn comments after a successful pickoff play at first base: "They must have sore hands out there."

The game is no staged reenactment.

It's a gritty, full-speed-ahead athletic contest with fastballs, curves, hard slides and diving catches. One of the hardest-playing competitors is Cliff "Buck" Archer, 42, the Westburys' Brooklyn-born catcher and sometime pitcher. Before the games Archer told me, "There's no way to describe how much I love baseball. I will play baseball until I drop dead on the field." Tall, gangly and dignified, with a large hawk-like nose that's not quite straight, Archer looks the part of a 19th-century ballplayer. Like many of the other players here, he regularly plays hardball in an adult league. He met his wife, Joanne, on the subway when she tried to read the sports pages over his shoulder; on their second date, he took her to Shea Stadium. "Our first date," she tells me, "we went to a bar and talked baseball."

Archer first visited Old Bethpage as a tourist in the late 1980s. On a trip in 1990, he says, "my friends were going, 'Come on, let's go see the cows.' I said, 'Hey, wait a minute, I'm watching this game here!' I couldn't believe what I was seeing. It was like watching history—the uniforms, the style of play." One of the captains said they were short a few players and wondered if any of the spectators wanted to play. "I must have looked like a 4-year-old in a toy store: 'Me! Me! Me!' They dressed me up, and I was hooked." Most of the players here, he says, were recruited the same way. "They come to watch a game, they start asking questions, and we sign them up."

Now, at the top of the ninth, Archer slams his jaw on the ground diving for a low foul to the left of the plate. Climbing to his feet, he spits a gold crown into his hand and walks it out to umpire Gary Monti behind the pitcher's box for safekeeping. The Westburys hold on to win, 14 to 10.

Officiating amid the hubbub, Monti is a peaceful if somber presence in a

RALPH "LIVE WIRE" AMITRANO

CLIFF "BUCK" ARCHER

GARY "REV" MONTI

JOHN "BLUE STREAK" MORRISON

AL "OLD DUTCH" DIECKMANN

TOM "SQUID" JORDAN

black bowler, black vest, black pants and white minister's collar. At a cookout following the second game (the Bellmore Seminoles over the Cold Spring Harbor Spiders, 5 to 3), Monti explains his outfit. In the decades following the Civil War, most small towns had a team, and one town would challenge another. The home team furnished the umpire. "A minister, or maybe the sheriff or mayor, was supposedly the most honest person in a town." Even out of uniform, Monti is addressed as "Rev" by many of the players.

Al "Old Dutch" Dieckmann, 52, the Hicksville Ozones' intrepid captain, joins us. At Old Bethpage, he's the acknowledged sage of bygone baseball trivia. Monti recalls the first time Dieckmann visited, as a tourist four years ago. "He came up and said, 'You know you're using the wrong home plate.' He said the plate back then was round because people originally used an old tin dinner plate. I said, 'Put on a uniform.'"

Tom Heinlein tries to slide past catcher Jason "the Spider" Pulido into home. Standing is pitcher Ken "the General" Patton, who has run in to help on the play.

"We read that some of them would slip a piece of raw meat inside to cushion the shock of the ball. That told us our pitching was all wrong."

Dieckmann, who works by day as a computer consultant, is small and gaunt. With rimless glasses, grizzled stubble on hollow cheeks, a direct, dead-serious gaze and an ever-present cigarette, Old Dutch seems to have wandered out of the smoke of a Civil War battlefield. "Visitors always ask, 'What are the rules of 19th-century baseball?' The rules changed so fast you can't generalize like that," he says. Old Bethpage's two leagues offer different glimpses of the game's evolution, and a new league planned for next year will depict the 1876 game. In that centennial year, pitchers had the luxury of a nine-ball count. Batsmen, meanwhile, were entitled to call their own pitches, high or low. "The umpire would ask, 'What's your pleasure, sir?' when you stepped into the box," says Dieckmann.

He and the other vintage ballists comb old game accounts for clues about how the game was actually played. "By the 1880s," says Monti, "catchers were wearing unpadded gloves. We read that some of them would slip a piece of raw meat inside to cushion the shock of the ball. That told us our pitching was all wrong. We shouldn't be just feeding the ball to the batters."

One of the promising rookies here is Tom "Squid" Jordan, a sure-handed 26-year-old with sideburns and curly hair who moved to the area last fall, after the baseball season ended. In Chicago, he'd played semipro baseball as well as adult-league softball (his team was the Wicked Squids, hence his nickname). He jumped at the chance to play at Old Bethpage, joining teams in both leagues. "I didn't think there was anybody in the world as fanatic about baseball as I was—until I met these guys," Squid says, gesturing at Dutch, Pigtail, Kid Speed, Two-Bag, Mickey the Lip and the others. "You can play in leagues with more talent than this one, but they don't care as much about the game. These guys are impassioned about baseball. They're not just players, they're historians. They'll talk about a play that happened in 1860."

The players' dedication extends to bodily sacrifice. Broken fingers are routine. The afternoon's losing pitcher, the Spiders' Bob "Scoops" DiPietro, shows me a finger he injured a while back; the second knuckle appears to have been rotated a quarter

As I watch incredulously from the on-deck circle, Kid Speed takes off from third and steals second *again.*

turn to the side. Rival pitcher Dan "Peachie" Salmon of the Westburys ("Peachfuzz" until his beard came in) shows me the thumb he broke in the first game he ever played here. "Actually, I broke it before the game. I was just playing catch to warm up." He rebroke it a few weeks ago. "It was my own fault. I was holding my thumb wrong on a hard throw from Squid."

The next morning, I recall Peachie's story as I stand in the infield with my legs wide apart, my back to third base, watching a rocket from Kid Speed in deep center field streaking toward my chest. In suspenders and a short-billed cap, I've joined the 1866 Mineola Washingtons for the day. One of my finger joints is already red and swollen from a careless catch I made during warm-ups. Out of the corner of my eye, I notice a Huntington Suffolk runner has rounded second and is heading straight for me like a sprinter on the home stretch. The ball slaps into my outstretched palms. I manage to hang onto it, pivot blindly and tag the onrushing Suffolk. To my relief, my hands hardly hurt at all. Perhaps this is because my pain circuitry is overloaded with signals from my right shin, where the runner just smashed into me. With three hands down to end the fifth, I limp toward the bench, comforted by a warm glow of accomplishment. Speed catches up to me: "I knew there was plenty of time to nail that runner, so I just lobbed it in there to you." Some things are better left unsaid, Speed.

Kid Speed, or Tom Heinlein, is a cheerful, unselfconscious and very fast-talking 28-year-old who's the acknowledged phenom of both leagues. He's not large, but he's strong. On the base paths he's a blur. Late in the game, Speed beats out a grounder, as he almost always does—he's batting over .500—and promptly steals second and third. Then, as I watch incredulously from the on-deck circle, he takes off from third and steals *second* again. Later, I ask for an explanation. "Basically, I just wanted to show the crowd it could be done." In the 1860s, he says, runners on rare occasions would run backward to confuse the infield.

Barry "the Magnet" Aguado (on one knee) has been run down by catcher Brian "Woody" Biscari and pitcher Bob "Scoops" DiPietro.

Al Dieckmann, this morning's umpire, arrived at game time carrying a beat-up leather carpetbag and smoking a brown cheroot. Wearing a minister's long black frock coat, black flat-brimmed hat, black vest and gold pocket watch, he looks like an undertaker in an old cowboy movie. He saw the getup in a Currier and Ives print of an old-time baseball umpire, he tells me, and borrowed the necessary garb from the museum's costume room.

I step to the plate, intent on choosing a promising pitch to address. With Casey-like resolve, I ignore the first two. Behind the catcher, Old Dutch growls: "Warning on the striker!" I glance back at his baleful poker face, wondering if I've committed some sin of bad sportsmanship. Actually, Dieckmann explains later, the phrase simply means you've refused to swing at a good pitch, so now he'll start calling them. Likewise, the first bad pitch draws a warning on the pitcher. In baseball's earliest days, umpires didn't call balls or strikes at all. With runners on base, a striker could watch 50 pitches go by, waiting for a wild pitch to advance the runners.

Finally, I smash a hard shot to the shortstop on one hop. I dash for first, hoping that he or the first baseman will bobble the ball, but the throw never comes. I'm out! By the rules of the 1866 "bound game," I've just remembered, a ball caught on one bounce is a hand down; the fly game

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was not universally embraced for another year or two. Dutch calls over to me, "Don't you hate that rule?"

As a striker, I sure do. As a pitcher, however, I could learn to love it. I find this out the following weekend, when I pitch six innings in relief in an 1860s pickup game, Brooklyn vs. Long Island. If bounce catches didn't count, I'd still be out there. As for pitching, I quickly learn, the tricky part isn't delivering the ball—it's an underhand game, after all. It's catching the thing bare-handed every time it comes back. Catcher Larry Lusha helps me out by returning it on the bounce. On pop-ups in the late innings, the softened ball is "egging"—elongating dramatically as it spins. Catching it is like trying to corral a small rodent. Luckily, Lusha bare-hands one foul tip after another, actually retiring the side this way in the sixth.

Nick "the Nugget" Garcia, aided by a nonregulation glove, shows how to take some sting out of a catch.

Sadly, my good fortune with foul tips is outweighed by the Brooklyn nine's ability to steal on me at will. With bare hands, there's no such thing as an easy catch; a hard peg to second is a daring gambit. The crowd's applause at the good plays is mixed with gasps and mutterings at all the scoring. I take it in stride—let *them* try playing this game without a glove. I end up losing 12 to 4, though technically, I believe, those were mostly unearned runs. Viewed from the 1860s, when scores of 40 to 30 were typical (the legendary Washington Nationals, an amateur team made up mostly of government clerks, once scored 106 aces to Louisville's 26), we played a defensive gem.

The spectators seem delighted at the spectacle of a live game from baseball's past, even if the play isn't always crisp. "I'm going to go back to Texas and start a vintage baseball club," says Tom Hampton, an engineer from Dallas, as he stands on the sidelines waiting for an 1880s game to start. Indeed, old-time baseball programs seem to be popping up everywhere. Clubs in Pennsylvania, Connecticut, Florida and Rhode Island have just begun fielding teams. Colorado already has 6, and Ohio 13, including four women's teams and the pioneering Ohio Village Muffins, founded in 1981 by the Ohio Historical Society. None of these play in leagues; for the most part, they play exhibition games, often at 19th-century restoration villages.

Most programs play by 1860 rules. Since the old rule books were fairly sketchy, today's vintage clubs are still refining their games. A traveling team drawn from Old Bethpage's players, the Brooklyn Atlantics, recently toured Ohio and Michigan to take on some of its peers. The competition was friendly, manly and sporting, though the Long Islanders snorted at some of their adversaries' rules as historically questionable. Playing the Greenfield Village Lah-De-Dahs in Michigan, a bewildered Peachie Salmon was politely scolded for sliding on his back to snag a pop-up. Tom Stoll of the Lah-De-Dahs explained to me afterward, "Our umpire will usually fine a player for leaving his feet in making a play, as a gentleman doesn't throw himself on the ground." The fine is 25 cents. Other teams call this the Lah-De-Dah rule. Doug Smith, manager of the Ohio Village Muffins, says his team no longer bans stealing. "The more research people do," he says, "the more holes are blown in some of the things we were doing."

For their part, the Old Bethpagers are a scrappy, heads-up band, and they don't doubt their Victorian forebears were as well. During their Ohio road trip, several of the Brooklyn Atlantics repaired to a sports bar where a TV was showing highlights of the day's big-league games. "We were all going, 'That's *easy* with a glove,'" says Kid Speed, laughing. "Everybody in the bar was looking at us. They were figuring, 'Oh, typical New Yorkers.'"

Doug "the Scrivener" Stewart hit .429 but says his ERA is incalculable. Doug "Mathew Brady" Merriam is based in Santa Fe, New Mexico.

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fired with finesse

BY JIM MORRISON

PHOTOGRAPHS BY KELLY CULPEPPER

"IT'S REALLY BEAUTIful, isn't it?" Mark Hewitt says, peering through a port in the side of his kiln. Inside, a meandering river of white-orange flame caresses a glowing clay jug as the fire glides through stacks of pottery.

Hewitt has allowed himself a brief moment of reflection during the final, tense hours of a marathon 3½-day firing. Quickly, the North Carolina potter gets back to work, sliding a thin slat of pine through a fiery portal. The slat sizzles, bursting into flame. Over days, the heat inside has been building slowly. A digital pyrometer indicates that the temperature near the kiln's front is 2,355 degrees Fahrenheit, hotter than molten lava.

Carefully, Hewitt and his apprentices are feeding pine slats into a succession of small stoke holes, fueling the intense heat across the fire-breathing beast's 40-foot length.

IN NORTH CAROLINA, ARTISANS DRAWING ON TRADITION AND LOOKING TO THE FUTURE ARE CREATING A HOT MARKET FOR POTTERY

Inside, within sight of each stoke hole, he has placed pyrometric cones that begin to melt at varying temperatures. When the cones at the back of the kiln curl or bend, the firing is finished. Hewitt and his assistants will stop stoking, brick up the openings and wait six days until the temperature drops below 100 degrees. Only then will they open the kiln and discover what beauty—or ugliness—the river of flame has created.

Last night, around 11, Hewitt had turned his tending duties over to a friend and slipped into bed in his farmhouse nearby. He didn't sleep a wink. "I was lying there fretting," he said when he reappeared at 6 A.M. "I'd hear every noise and I'd think it was the pots breaking."

Hewitt was fretting because any number of calamities may befall the 1,700 pots—four months' work—glowing inside the kiln. Fire too hot and the clay gets brittle. Raise the temperature too high, too fast, and pots may explode. Hewitt could use a modern gas or electric kiln that would yield predictable results. But for him the aesthetic rewards of taming the inferno outweigh the

Potter Mark Hewitt (left) has halted his wheel to add a coil of clay to the rim of a large vase he is turning. During firing (above) flames course around the elegant wares in a wood-fired kiln.

financial gamble. "This is the hard way of doing it. It's very labor-intensive. It requires skills that you learn only by doing," he said the day before, during a break. "I feel like the last of the dodoes."

The pottery tradition in North Carolina, as rich as the local clay deposits, attracted the British-born Hewitt to the eastern Piedmont in

Before loading their kiln, Ben and LoriAnn Owen check glazed pots for imperfections.

1983. When he arrived, there were only about nine or ten potteries in the area. Most of the owners were from families like the Owens, the Coles and the Teagues, who have created the area's utilitarian stoneware going back many generations.

Now, more than 90 potters ply their craft in and around Seagrove (pop. 244), about 35 miles southwest from Hewitt's farm in Pittsboro. Hundreds more are spread throughout the state. Those numbers reflect the resurgent popularity of homegrown pottery in North Carolina. Customers travel from afar to attend kiln openings, often arriving at dawn

to get a coveted spot at the front of the line. Many shops, however, stay open year-round. Museums throughout the state have staged exhibitions featuring local potters. And the $2.1 million North Carolina Pottery Center in Seagrove opens in November. Built with $1.3 million in private and corporate donations, and $800,000 from the state, the center features a museum and an education center and will operate as a starting point for tourists visiting area potteries.

Unbricking the door to his kiln, Ben Owen gazes upon the fruits of his labors.

Wheel-turned pottery in North Carolina dates to the arrival of the Moravians in the Piedmont in the 1750s. Farmers needed wares to preserve and contain foods and liquids. So potters produced churns for butter-making, jars for pickling, jugs for vinegar and liquor, and mugs, pitchers and bowls for the table.

While the craft died in most other states during the late 19th and early 20th centuries, the agrarian culture and the strong family tradition kept it alive in North Carolina until it found a new market as art. "When the Industrial Revolution catches up to a craft, it usually destroys it, because a factory product is cheaper and probably works better—unless the tradition can adapt to new conditions and changing tastes and find new audiences. That's what these people were lucky enough to do," says Charles G. Zug III, professor of folklore and English at the University of North Carolina and author of *Turners and Burners: The Folk Potters of North Carolina.*

Potters, who once supported themselves by working other jobs, can make a good living these days doing what they love. Sid Luck, a fifth-generation potter, chose to teach high school chemistry when he graduated from college. "There was just no market for pottery," he says. In 1987, after 17 years of teaching, he quit and opened Luck's Ware, off winding Adams Road in Seagrove. While most of his offerings are inexpensive—a coffee mug retails for $5—his volume is high enough that he earns as much as he did in academia.

In the Catawba Valley, on the state's western side, Burlon Craig's career reflects how the craft has come to be regarded as art. Craig, 84, spent much of his life farming, and working in a furniture factory to make ends meet. He turned pots at night and on weekends. Now his jugs are in such demand that customers take a number to prevent free-for-alls at sales. When he began in the 1930s, Craig sold five-gallon jugs for 50 cents. In the 1970s, when he had a storage shed full of unsold pottery, he sold jugs for $6. Today, collectors

Spewing flames like some mythical beast, the kiln at Ben Owen Pottery burns full blast as a worker keeps a close eye on the firing process.

Neither rain nor an hours-long wait dampens the enthusiasm of a long line of customers eager to buy pottery on the first morning of Mark Hewitt's spring sale.

lucky enough to hear about his annual sale fork over $500 for a five-gallon face jug. (Face jugs are an African tradition brought to the South by slaves.)

When Hewitt first arrived in North Carolina, he packed his mugs, pitchers and planters and lugged them to fairs and a flea market in Raleigh in a quest for customers. These days, buyers flock to his spring, summer and winter weekend sales. At one sale last year, he sold his entire stock in half a day. Some of his largest pots, 135 pounds of clay decorated with drips caused by melting glass, ash and salt, are snapped up for as much as $3,500.

"I think North Carolina is probably the state that has the longest continuing tradition of pottery as it came to us from Europe," says Jack Troy, a potter and the author of *Wood-Fired Stoneware and Porcelain*. "If America has a pottery state, it must be North Carolina."

Over two weeks of traveling North Carolina's back roads, I dropped in on potters as they prepared for their spring openings. I learned that the tradition continues to evolve. No longer are potters constrained by the types of local clay and glazes. No longer do they learn only regional shapes and forms. Many of the newer potters are academically trained and well traveled, so a range of global styles influence their work.

But the connections to the past remain vital for many, including Hewitt. His father and grandfather had been directors at Spode Ltd., the fine china manufacturer in Stoke-on-Trent, England. But he fell in love with simple utilitarian pots after reading *A Potter's Book* by Bernard Leach, the eminent British potter who helped rekindle interest in early ceramic traditions. Apprenticeships with master potters Michael Cardew in Britain and Todd Piker in Connecticut preceded Hewitt's drive south to look for a place to set up shop. Near Pittsboro, he and his wife, Carol, purchased a ramshackle farm, transforming the chicken house into his studio and the barn into a rustic showcase for his kiln openings.

Six days after Hewitt and three apprentices closed his fiery monster, I arrive for the unloading, scheduled to begin at 8:30 A.M. The impatient potter, however, had broken into the front of the kiln the afternoon before, taking out a few dozen pitchers and jars. "It looks really spectacular to me," he says as he starts pulling bricks from the kiln's side door. Stacked behind the door are the large planters and jugs that fetch the highest prices. They are also the most vulnerable, the most likely to crack or shatter. Hewitt and an apprentice strain to carry out a golden planter with dark-blue streaks down the side. They return for another. "Shoot, that one split," Hewitt says, stooping inside the kiln. It's the first big casualty.

Hewitt expects a few disasters. Only about two dozen North Caroli-

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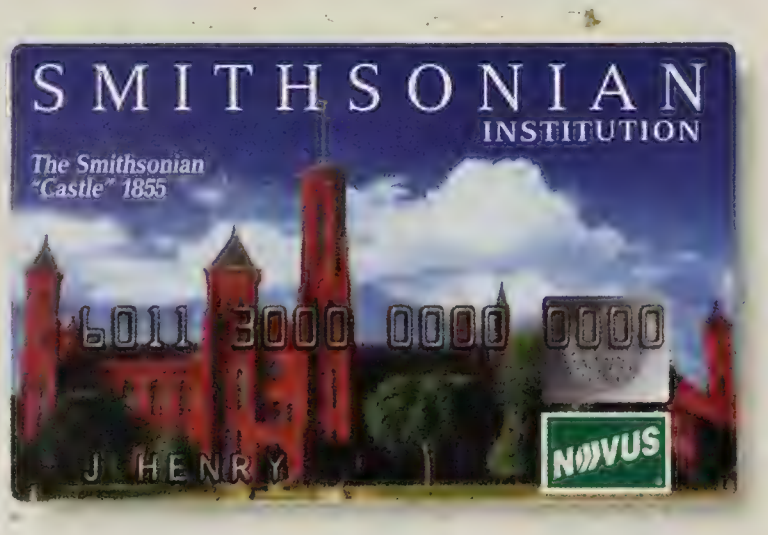

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na potters fire wood kilns, because it's so risky. To Hewitt, though, the downside is worth the unique qualities that come only from his unpredictable beast. "There's a depth to the colors and a complexity to the finish that you don't get from a regular kiln," he says. As the unloading continues, Hewitt's spirits rise. A few mugs have fallen, a few small planters are cracked, but the loss is minor.

"The space in the kiln," Hewitt explains, "is sort of my aesthetic medium. Every single cubic inch can create a different effect." Pitchers and jars closer to the firebox show drips resulting from ash falling on their shoulders and melting. Hot embers create a mottled charring on vases that have been placed on the floor near stoking holes. Other pots feature gentle flowing streaks down their sides caused by runny glazes and the salt that Hewitt blew into the kiln using a leaf blower. At one point during the firing, he casually tossed mugs of salt through stoke holes onto large pots. The salt melted instantly, flowing down their sides.

Hewitt's use of salt is an example of how the state's pottery traditions continue to evolve. Salt-glazed stoneware, recognizable by its orange-peel texture, has been created in the eastern Piedmont since the late 18th century. But Hewitt tweaks the tradition, mixing salt with other glazes for a variety of colors and textures. For example, he applies an alkaline glaze associated with potters in the Catawba Valley that yields a glossy olive green, but by combining salt with it, Hewitt gets a golden yellow. On other pots, he diverts sharply from tradition, using a white Shino-type glaze native to Japan, or a crinkly black manganese slip he created.

His shapes are inspired not only by the simple utilitarian wares of North Carolina, but by the pots he's seen during travels in Japan, Korea, Taiwan, Nigeria, the Ivory Coast and Mali, as well as Great Britain and the United States. "I beg and borrow in a postmodern way," he says.

A hand-painted platter with a Shino-type glaze catches a customer's eye at Hewitt's sale (top). Another shopper selects an alkaline-glaze teapot.

Leaving Hewitt and his apprentices to the task of sanding and preparing the pots for sale, I drive to Seagrove. There, along winding Route 705, one pottery sign after another beckons. Pottery Junction, Turn and Burn Pottery, Old Hard Times Pottery, Dirt Works, Frog Pond, Luck's Ware, Rockhouse Pottery. I pull in at Ben Owen Pottery just across from the Westmoore Family Restaurant.

Ben III, as Owen is called in these parts, is in the early hours of a two-day firing. It's 3:40 P.M. on a Monday, and the new digital pyrometer that arrived this morning reads 431 degrees. "We're going up 100 degrees an hour for the first 20 hours or so," he says. He was up late the night before, putting glazes on the final 50 pots he'd turned over the weekend. He is behind, unable to meet the demand. Special orders jotted on Post-it notes are scattered on a wall of his office inside the store, a few feet away. Elton John and Elizabeth Taylor are customers.

If there is a royal family of potters in North Carolina, Ben Owen III is the crown prince. Like many of the young potters in the area, he studied ceramics in college, earning his degree from East Carolina University. But he also learned from his grandfather, Ben Owen, perhaps the most famous North Carolina potter of his generation. Ben III was 8 when his grandfather started taking him out to the shop to show him how to throw pots.

Pots were everywhere in the Owen family's home. Over time, little Ben learned the history of each one. Many bore the stamp of Jugtown, where his grandfather began working in 1923, when he was 18. At the time, the old stoneware shops in the area were closing. Cheap industrial wares had shrunk the market until only a demand for whiskey jugs kept potters in business. With Prohibition in 1920, that outlet dried up as well. But Jacques and Juliana Busbee, Raleigh natives, figured they could sell North Carolina pots in a shop they operated in Greenwich Village, New York.

The Busbees opened Jugtown outside Seagrove and hired young potters like Ben Owen, who were willing to try the new shapes that the Busbees believed were key to building a new clientele. They took Owen to museums in New York and Washington, D.C., and gave him sketches, pictures and pieces of Oriental pottery to imitate. They introduced new glazes,

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including "Chinese blue," which became a favorite of collectors. Soon, Oriental shapes and glazes became part of the local idiom. Jugtown remains a rustic mecca today. Buses pull into the lot daily, unloading tourists who browse a small museum and a shop. Vernon Owens, Ben III's distant cousin, owns the pottery with his wife, Pam. (One branch of the family added an *s* to the surname.) True to the tradition, they create a variety of utilitarian stoneware.

Jugtown survived because the Busbees fundamentally changed the market. Their customers considered their purchases art, not merely necessities of everyday life. Ben III's shop reflects that shift; vases, some glazed with his version of Chinese blue, sit atop pedestals illuminated by track lighting. It's as modern an art gallery as any in SoHo.

Over two days, the firing behind the store becomes a leisurely social event. Taylor Haynes, world traveler, furniture designer and friend, takes some stoking shifts. LoriAnn, Owen's wife, keeps plenty of cold water on hand to quench the stokers' thirst. Owen's father, Wade, who runs a cattle farm, drops by to tell a few tales. His mother, Shirley, brings dishes from a cookbook she's writing. Customers wander out to ask questions about the kiln and recall watching Owen's grandfather turn pottery on a wheel decades ago.

Jugtown survived because the Busbees fundamentally changed the market. Their customers considered their purchases art, not merely necessities of everyday life.

Stoking his kiln, which is partially underground, Mark Hewitt, left, feeds pine slats into the fiery inferno while assistant Bill Dow stirs the embers.

By 2 P.M. on the second day, the pyrometer reads 2,206 degrees. Owen will hold the first chamber of the kiln between 2,300 and 2,500 degrees for the next six hours, a technique called soaking. "You get a lot of colors and effects in the glaze by soaking it," he adds. If he soaks the pots for too long, the glazes will run. If he doesn't soak them long enough, they may not develop the colors he wants. Nearly four hours later, Owen peers through the firebox, checking the first row of pots. Before pyrometers, his grandfather checked a kiln's temperature by monitoring the changing color of the flame at high heat. He also watched the glazes on pots near the firebox, something Owen still does.

Two hours later, he decides to raise the temperature to 2,400 degrees, by feeding more wood to the fire. As the pyrometer clicks higher and higher, friends and family count up—2,397. . . 2,398. . . 2,399. . . At 8:01 P.M., the pyrometer reads 2,400 degrees. Owen and Haynes seal the first chamber, then move to the rear of the kiln and begin stoking the back chamber. As they do, flames shoot from ports in the roof and from the chimney. The heat from the open firebox and the exertion are such that Owen sweats despite the cool night air. "It's kind of like taming a dragon," he says during a break. "The kiln wants to shoot all this flame out, and you've got to control it." By 9:55 P.M., the dragon has been domesticated. Cones in the kiln

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are bent to Owen's satisfaction. He and Haynes close the ports and contemplate catching up on missed sleep.

When Owen unloads the kiln three days later, the results will be mixed. Several vases crack as he brings them out. Overall, though, he figures the loss at less than 10 percent, considerably better than one early firing when he lost about half his wares. "Every firing is a learning session for the next one," he says.

Craig and his son still dig their own clay from a site 14 miles away, then grind it in a mill out back. That's a rarity; most potters today order clay from stores.

His pots pay homage to the Oriental shapes that his grandfather made part of the North Carolina tradition, but they also show influences from Owen's college studies and his travels in Japan. He has made his peace with modern amenities. He supplements wood firings with a gas kiln. And he throws some pots using premixed porcelain, a whiter clay, with glazes that yield vibrant blues, coppers and greens. "There is change," he observes, "within a tradition."

Rising early on a gray morning, I drive two and a half hours into the foothills of western North Carolina to meet Burlon Craig at his home on Cat Square Road near Hickory. When I pull up, the door to his shop is open and I see Craig hunched over an electric wheel. He's cranky this morning. His right leg—the leg that held his weight while kicking a treadle wheel all those years—is bothering him. He's got pots to make and little time for chat, but he agrees to talk while he works.

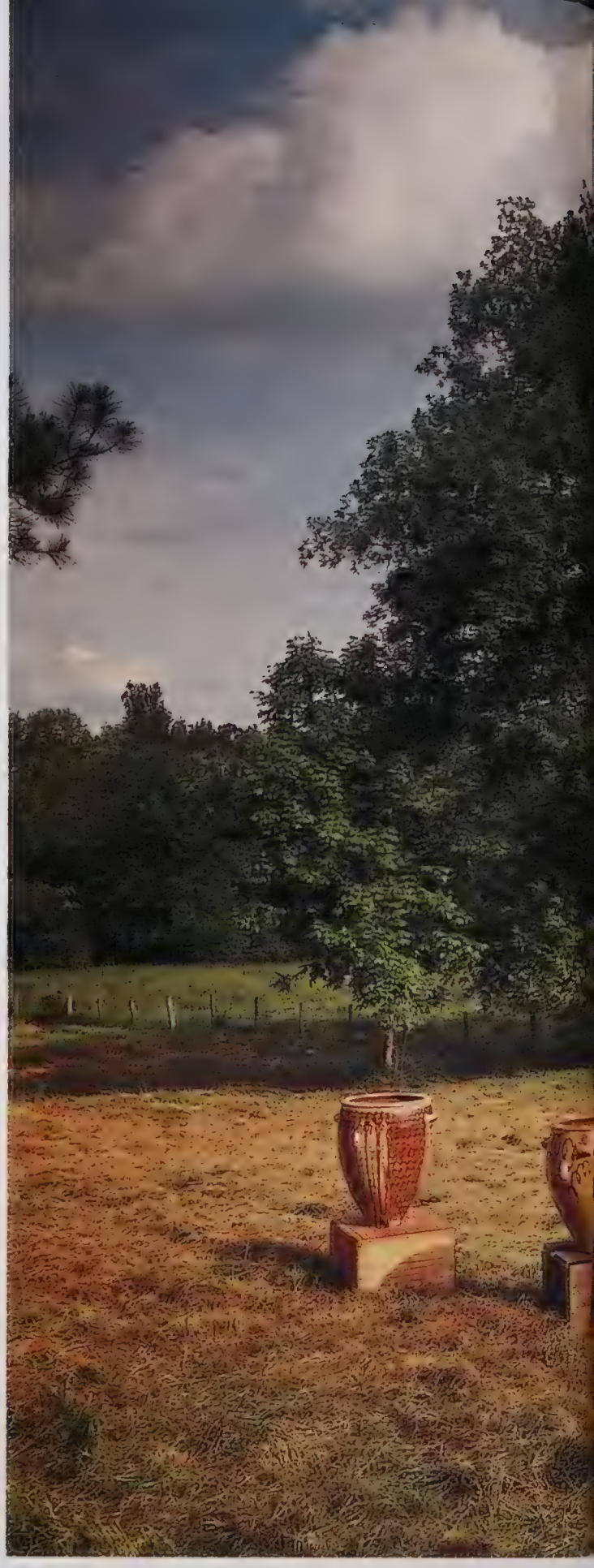
Craig finishes a milk jug and sets it with others near a rusted stove burning wood in the center of the shop. He walks across the dirt floor to one corner, pulls a ball of clay from a pile and sets it on an old-fashioned scale. Craig and his son, Don, still dig their own clay from a site about 14 miles away, then grind it in a mill out back. That's a rarity; most potters today order their clay from supply stores.

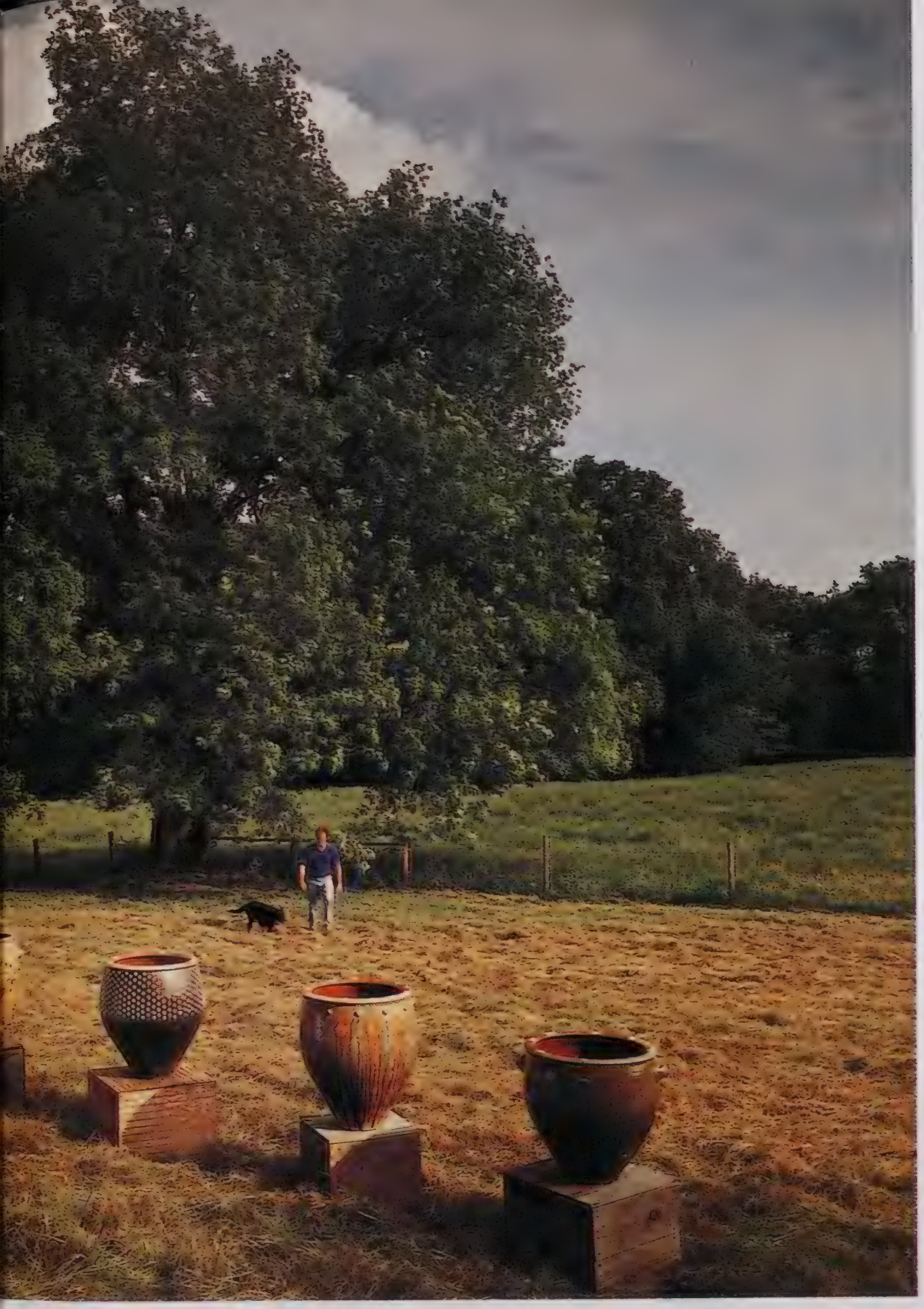
After reducing the weight, Craig takes the ball from the scale and splits it with a wire attached to his workbench. Then he slams the chunks of clay on the bench, kneading them with thick, strong hands. He repeats the act again and again until he is happy with the consistency. Returning to the wheel, he wets his hands in a nearby bowl of water and centers the ball with remarkable ease. If the clay is not centered, the pot will be lopsided when he pulls it up. He slaps it into place on the first try.

He flattens the ball a little, then lowers a knob attached to a long wooden arm into the center, creating an indentation, and quickly pulls the sides up with his hands. In a minute, Craig has almost magically produced a cylinder about 14 inches high. He thins the walls, slows the wheel and pauses. "I don't like that much," he says. "I believe I'll widen that out." A few more turns and the shape slowly changes. Suddenly, he's finished. He uses a piece of wire attached to two pegs to cut the jug from the wheel.

We walk outside to inspect his kiln, which looks like a Civil War ruin, though it actually dates to the 1930s. Craig got his start making pots by helping a neighbor grind clay and collect wood when he was about 14 years old. "Every chance I had, I'd get on the lathe and turn," he says. After his discharge from the Navy in 1945, he purchased the shop, house and kiln for $3,500.

He's been turning pottery ever since, though some years, he concedes, he didn't make much money because he had few customers. In recent years, collectors have come to prize his alkaline-glaze face jugs. Craig made his first face jug in the early 1950s. These days, he fires his kiln just once or twice a year. Though slowed





Mark Hewitt, traipsing his farm with his dog, Molly, surveys a collection of some of his largest planters; these behemoths are more than three feet tall.

by age, he still turns every day. "I get tired of sittin' in the house," he says. For years, that restlessness was all that kept the alkaline-glaze tradition alive.

The Saturday morning of Hewitt's spring sale breaks unseasonably cold and drizzly. No matter. Nearly 150 people have lined the dirt road that leads to his farm. Immense, handsome jugs and planters border a path by the kiln. Hewitt has cheekily named one large planter "Monsta V: The Resurrection." It sells for $2,500. The path leads to the barn, where pitchers, vases, plates, bowls, umbrella stands and mugs are displayed.

Rob Hazelgrove from Raleigh is second in line and not happy about it. "I hit the snooze button one too many times," he says. Hazelgrove had been first for the last several sales, but Tom Rose of Raleigh arrived at 6 o'clock to beat him this morning.

A few minutes before 9, Hewitt announces that customers will be led single file down the path to the promised land of pots. "Don't pass the person in front of you," Carol adds in a schoolmarm admonition. "And don't run or you will be sent back." With that, the sale begins. Customers do their best Olympic racewalk down the path and fan out to claim their prizes. Inside the barn, a long table of plates selling for $40 each is emptied within five minutes. Gone, too, are most of the vases, including some tall, elegant cylinders Hewitt has made for the first time. Veteran shoppers grab first, filling sacks or baskets, then retreat behind the barn to sort through their hoard and do a little trading.

The sale is a sort of reunion among pottery collectors, who eagerly compliment each other on their choices. Cashiers, set up behind tables in an old pasture, ring up the sales. Hewitt works the crowd, chatting with customers who have become friends over the years. He calls his work "high-status functional entertainment," an acknowledgment that his rural utilitarian pots command urban gallery prices—prices that mean his planters may never hold soil or his mugs an ounce of iced tea. "Potters have an elevated status here," he says. "I'm preaching to the converted."

Preaching, that is, to converts like Tom Rose, who grabbed a $650 platter for his wife. And Rob Hazelgrove, who drove back to Raleigh with more than $1,000 worth of pottery, including mugs, plates, a vase and a planter. Before he leaves, he tries to explain the appeal of a simple pot.

"There's something about Mark's work," he says. "It just speaks to you. If you buy one piece, you're hooked."

Jim Morrison, a New York-based writer, stoked kilns while reporting this story. Kelly Culpepper, who lives in North Carolina, has shot several assignments for SMITHSONIAN.

ON THE FRANKI

An archaeologist travels ancient trade routes in search of clues to a lost civilization

IN OUR CARAVAN OF FOUR LAND CRUISERS, WE FOLlowed a vague dirt track along the desolate coast of the Arabian Sea. The temperature was 95 degrees Fahrenheit, the air as humid as a steam bath. On either side stretched a chaos of sand and stones, blurred to a gray smudge by monsoonal mist.

Suddenly the tall, white-haired man sitting to my right cried out, "*Stenna! Stenna!*"—"Stop here!" in Arabic. Reluctantly, our driver applied the brakes.

Expedition leader George Hedges, his face streaming sweat, climbed out of his vehicle. "What is it, Juri?"

"Triliths, I'll bet," said Juris Zarins, striding toward the shore. Where the rest of us, stupefied by heat and monotony, had seen only rocks and dunes, the practiced eye of an archaeologist had caught the signature of the mystery that had brought us to this remote place.

We were in the Mahra governate, the easternmost and least-known region of Yemen. Piling out of the Land Cruisers, we headed after Zarins and, 80 yards from the road, came upon a remarkable sight.

Three separate rows of two-foot-high stone pillars stretched parallel to the coast. Each pillar was composed of three stones (triliths) planted upright in a tight triangle; each row stood upon a bed of cobbles bordered with bigger stones in an elongated, cigar-shaped platform. At intervals a few feet south of the trilith rows, we saw detached circular rings filled with small round stones.

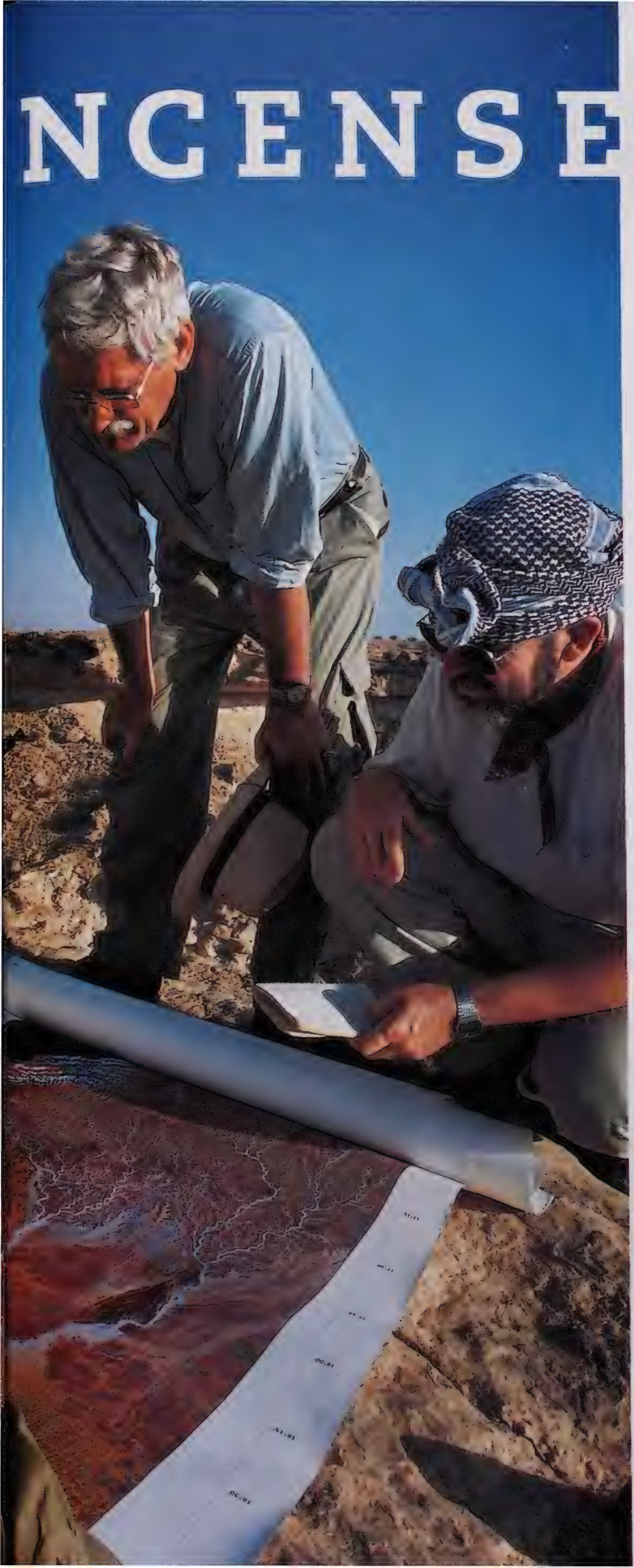
"The British in Oman dug four of these," said Zarins. "They got carbon dates from 200 B.C. to A.D. 300."

"What are they, Juri?" asked one of the team.

BY DAVID ROBERTS

PHOTOGRAPHS BY KAY CHERNUSH

NCENSE TRAIL



"Nobody has the faintest idea," Zarins answered. "But I'd like to think they're directional markers for the incense caravans."

According to Christian belief, nearly 2,000 years ago the Magi—three wise men from the East—traveled to Bethlehem to worship the Christ Child in the manger. As gifts, the Magi brought gold, frankincense and myrrh.

Before arriving in Yemen last June, I had only a notion of what frankincense and myrrh actually were. The resins from spindly trees that grow in just a few places on earth, these gummy elixirs, once highly prized from Rome to India, were deemed essential for a host of uses ranging from religious to cosmetic to medicinal. At the time of Christ, frankincense was not only more costly than gold—it may have been the most precious substance on earth.

Around 2000 B.C., thanks to the domestication of the camel, a complex trade network evolved to transport the priceless resins from the remote valleys where the trees grew to the markets where kings and emperors vied for the finest grades. From the beginning of the first millennium B.C. to the fourth century A.D., the incense trade was as vital to the civilization of the West as the silk trade was to that of the East. Today, the Silk Road, which links such legendary cities as Kashgar and Samarkand, is well traveled. But the Incense Road has been lost to history.

To rediscover it was the primary goal of our expedition. And as Zarins picked up a flint flake here, a burnished potsherd there, he was the first archaeologist ever to find these traces of the civilization from whose heartland camels once carried myrrh to Rome, frankincense to Jerusalem.

"I'm trying to prove the archaeological reality," Zarins summed up his mission, "of a people who've been reported only in classical, biblical and Islamic sources."

There is no dearth of ancient references to the incense trade; indeed, the rumors set down by Roman geographers and Christian prophets incline toward the magical and fantastic. For Herodotus, in the fifth century B.C., frankincense

Juris Zarins, standing, and his team examine a Landsat photograph created by Ron Blom, right, to reveal ancient caravan routes. Inset: In Yemen, a young vendor sells once-precious frankincense for $2 a bag.

and myrrh trees grew only in Arabia. But the secret groves where nameless workers gathered the priceless sap were guarded, he said, by venomous flying serpents.

Five centuries later, Pliny the Elder identified the tribes who collected incense as the Scenitae, or "tent-dwellers." "They are the richest races in the world," he baldly claimed; by Pliny's time, in fact, the incense region was commonly known as Arabia Felix—"Arabia the Blessed." Yet the place remained a geographical enigma. No Greek or Roman had ever seen a frankincense tree.

The most Pliny could say about the location was "*octo mansionibus distat,*" that it lay eight oases, each a day apart, to the east and south of Shabwa, a city that stands today about 100 air miles east of Sanaa, Yemen's capital. For Juris Zarins, that single phrase from Pliny may be a vital clue.

Aside from the passage in Matthew about the Magi, the gospels recount that before his crucifixion, Jesus was offered myrrh with wine, which he refused, and that after his death his body was treated with "a mixture of myrrh and aloes." In Christian symbology, as historian Nigel Groom points out, frankincense comes to be associated with Christ's divinity; myrrh, with his persecution and death.

More than 900 years earlier, according to I Kings in the Old Testament, the Queen of Sheba made her celebrated visit to King Solomon "with a very great retinue, with camels bearing spices [aromatics] and very much gold and precious stones." "Sheba" is commonly equated with Saba, an ancient kingdom in Yemen; the queen's journey probably followed a major incense trade route.

In Arab chronicles, the legends of the frankincense lands become associated with a lost city called Ubar. In the tenth century A.D., the historian Abu Muhammad al-Hamdani

The 2,000-foot Jebel Mahrat escarpment blocks the monsoon rains, creating a microclimate where frankincense trees grow.

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Zarins studies a sherd of a Ming pottery teacup as he leans on a "sewn" boat, a type that once carried frankincense to China.

alluded to Ubar as being "first among the treasures of ancient Arabia." But in the Koran, Ubar is perhaps Iram, a city of the wicked, like the biblical Sodom and Gomorrah; Allah destroys it with "a hurricane bringing a woeful scourge."

Much later, in the *Arabian Nights*, Iram reemerges as "the petrified city," its unrepentant denizens frozen in mid-act by a vengeful Allah, its palace filled with "diamonds as big as ostrich eggs."

European explorers began to probe the interior of southern Arabia in the 18th century. The pitiless wilderness took its toll. A Danish expedition returned in 1770 with a sole survivor, adventurer Carsten Niebuhr. By the early 20th century, others had taken up the challenge of crossing the Rub al-Kahli, or Empty Quarter—the world's largest pure sand desert. These daring pioneers fell under the spell of the legend of Ubar. Harry St. John Philby (father of the spy Kim Philby), T. E. Lawrence (Lawrence of Arabia) and Wilfrid Thesiger all toyed with the notion of finding the lost city. Lawrence bestowed upon Ubar the memorable epithet "Atlantis of the Sands."

It was Bertram Thomas in 1930 who became the first westerner to cross the Empty Quarter. One day, somewhere in northwestern Oman, Thomas' party passed a wide depression in the desert floor. "Look, Sahib," said a bedouin guide, "there is the road to Ubar."

Yet the lost city stayed lost. In the early 1980s, American filmmaker Nicholas Clapp got caught up in the quest. Over the next few years he recruited the flamboyant British polar explorer Ranulph Fiennes and Juris Zarins, a professor at Southwest Missouri State University who had already done years of seminal fieldwork in Saudi Arabia.

Clapp's great stroke came when he read a newspaper account of the accidental discovery, in radar images shot from the space shuttle, of ancient riverbeds in the Sahara lying hidden beneath present-day sand dunes. He contacted Ron Blom, a geologist at the Jet Propulsion Laboratory in Pasadena, California, to ask if the technique of subsurface radar imaging could detect ancient caravan trails. Initially skeptical, Blom too found himself caught up. Clapp also rounded up George Hedges, a high-powered Los Angeles lawyer and student of the classics and archaeology. Hedges proved a whiz at logistics and fundraising.

The climax of this coordinated effort came in 1991, when Clapp's team, tipped off by Ron Blom's analysis of satellite photographs, found the ruins of an Iron Age (1200 B.C.-A.D. 500) fortress at the oasis of Shisur in Oman. Guided by Zarins' canny intuition as to where to dig, the team spent several seasons excavating the fortress, unearthing a walled city. At the center of the site, a limestone sinkhole bore evidence of a sudden collapse in ancient times. Here, thought Clapp, was proof of the cataclysm recorded in the Koran and the *Arabian Nights*.

The discovery made headlines: the lost city of Ubar had been found. Both Clapp and Fiennes wrote popular books that chronicled the search and discovery as a good old-fashioned archaeological detective story.

For Zarins and Hedges, however, the story was not so neat—and the quest had just begun. Even as he dug at Shisur, the archaeologist concluded that Ubar was not a single, palatial city, but a region. Perhaps Shisur was one of Pliny's eight oases; if so, where were the other seven? It was Zarins' hunch that Ubar more or less corresponded with the land of the Iobaritae, recorded on the map of the world compiled by Ptolemy around A.D. 150.

Zarins was searching not for diamonds as big as ostrich eggs, but for clues to a vanished civilization—one that in ancient times ranked among the most prosperous and influential in the world. To find the answers is the work of a lifetime, and our venture into the Mahra country constituted a short season's probe.

We had flown from Sanaa to Al Ghaydah, Mahra's only sizable town, on the weekly flight. There we met our Yemeni drivers, who had pushed the Land Cruisers more than 1,000 miles from Sanaa. Besides myself and photographer Kay Chernush, our entourage comprised Zarins, Hedges, Blom, a botanist, and an archaeological assistant. Crucial to our venture was our guide, Salim Lahaimer Al Gomeri, a Mahra man with some training in archaeology.

For three days in the drenching heat we trundled fitfully along the coast of the Arabian Sea. Every ten miles or so, we passed through a village, where locals stared dumbfounded at our intrusion. We were not the first westerners they had seen: from 1967 to 1990 Mahra had been part of the People's Democratic Republic of Yemen, the only Marxist Arab state, and Russian soldiers had ventured there to wage an attack on Oman.

This was Zarins' first chance to survey this coast, and so we slammed on our brakes every time his keen eye spot-

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Using Landsat images, Zarins led his team down the coast of the Arabian Peninsula (top). They found clues to ancient cultures at Jarub and Damqut. Shisur, Habrut and Sarif, theorizes Zarins, may be three of the eight oases on the lost Incense Road. Sarif was found by tracing faint caravan trails (right).

ted the glitter of flint or the upright spikes of a distant row of triliths. And on this bleak shore, so stony and apparently lifeless today, we found a prodigious number of signs of ancient settlement.

Had Zarins focused only on the incense trade, he would have singled out Iron Age sites. But the man is too good an archaeologist to shirk the duty (and privilege) of recording everything he comes upon. Thus we prowled across a Neolithic (prior to 2500 B.C.) shell midden near a lagoon, and among Bronze Age tombs (2500-1200 B.C.).

At each site Zarins enlisted us to pick up potsherds and flint flakes, making a hasty collection that back in the lab would serve as a diagnostic sampling. At a place called Jarub, we found a colossal tell—a platform mound, 900 yards long by 250 wide, its upper surface topping out a full 20 feet above the beach. The tell teemed with artifacts.

Despite the debilitating heat, I found my collecting chore pure delight. Along with Iron Age sherds of burnished redware, I found beautiful pieces of Ming pottery traded from China. ("About A.D. 1360," said Zarins as I handed him a fragment.) The potential of the tell, its tons of dirt packed with more than 3,000 years' worth of human debris, was mind-boggling. In some future season, Zarins would dig an exploratory trench.

Just beyond Jarub, savage limestone cliffs more than 2,000 feet high began to crowd the shore. The dirt track, blasted in the 1970s to support the Russian military effort, wends its astonishing way among these precipices.

It is this escarpment, the Jebel Mahrat, that generates monsoon rains. And though the phenomenon is still not fully understood, it is only in the monsoon's shadow that frankincense trees can grow. Despite their importance to human history, frankincense groves are so elusive that even today no one knows their full range.

That evening we arrived in Damqut, an ancient village perched spectacularly at the mouth of a wadi, between two precipices. Salim had bought a goat, and his brother, who lives in Damqut, unceremoniously butchered it. Two hours later our gang was dining on goat stew.

We were utterly drained from the day's work in the soggy heat. Since dawn I had drunk four quarts of water, seven cans of soda, eight cups of sweetened tea and three cups of bedouin coffee, but I was still thirsty. With sunset the wind died, the temperature stayed in the 90s, and bathed in sweat, I had a sleepless night.

We spent most of the next day in Damqut. Zarins was thrilled. The site was one of the richest he had ever seen. For hours, in a drizzle that did nothing to cut the heat, we gathered more samples from the ruins of an Iron Age fort, from the stony grid of a village, from boat graves scattered near the soccer field and from a Neolithic shell midden at the mouth of Damqut's exquisite natural harbor.

And here we came upon the only frankincense tree we would see. It stood in a garden where it had been transplanted from the desert north of the mountains. We touched the tree's scabby yellow bark as Salim pointed out the sliced-open joints from which the golden sap oozed.

Our botanist, Tom Huggins, got out a coring drill. No one knows how fast or how long frankincense trees grow. Breathless with opportunity, Huggins laid his metal bit against the sliced joint to take the first frankincense core ever gathered. Zarins stopped him.

"Tell them it won't hurt the tree!" Huggins pleaded.

"Doesn't matter," said Zarins. "If the tree somehow dies, we'll never be allowed back in Damqut."

JIM KNIGHTON/WORLDSAT; ACQUIRED BY JUAN MAÑÉS ARCHAEOLOGICAL PROJECT (2)

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"I'm trying to prove the reality of a people reported only in classical, biblical and Islamic sources."

Salim's brother had told us there was a frankincense grove just up the wadi behind town. But as we started off in that direction, we were told a rather different story: the grove was actually ten miles away by a difficult footpath; even the harvesters took two days to reach it.

Pliny was the first to suggest that, in Herodotus' tale of flying serpents guarding the frankincense trees, a deliberate mystification of the source of the priceless sap was at work. Now I wondered whether, 2,500 years later, the same sort of mystification was still in effect.

A week before, back in Sanaa, I had wandered into the souk—the teeming open-air market in the Old City. Edging past stalls hung with old silver jewelry, great cubes of pressed dates, and the curved daggers Yemenis call *djambias* (every male wears one tucked in the front of his waistband), I came to the incense area. "*Luban*?" I queried, using the Arabic word. The man in the stall indicated a pile of pale-yellow, gummy blobs.

Could this homely stuff have once been the most precious substance in the world? I must have looked dubious, for the vendor whipped out a cigarette lighter and lit a few grains, inviting me to take a whiff. For 250 riyals—about $2—I purchased a small plastic bag full of frankincense.

Back in the hotel, Zarins picked up a kernel. "Here's what I do," he said, placing it atop a lightbulb. Soon thin fumes trailed above the nightstand. I breathed in a subtle, piney smoke that incorporated the essence of dreamy calm.

Babylonians, Sumerians, Assyrians and Persians offered frankincense and other aromatics to their gods. Romans and Greeks burned it in their temples, a practice later adopted by Christians. The Romans employed frankincense lavishly in cremations: the emperor Nero is said to have squandered a year's supply of the invaluable resin in the funeral of his beloved consort, Poppaea.

Myrrh was most commonly used as a base for cosmetics and perfumes. The Egyptians employed frankincense

During the excavation in 1991, Zarins took an aerial photograph of the cataclysmic sinkhole at Shisur, or "Ubar."

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At Sarif, Iron Age triliths are oriented to the summer solstice; a guide carries an AK-47 for protection against marauders.

in their embalming procedure. And the ancients believed the sap could bestow scores of medical benefits; Arab writers vouched for its efficacy in treating everything from tumors to gonorrhea; Romans claimed it cured "broken heads" and "malignant ulcers about the seat."

In an age when people bathed infrequently, incense was vital for disguising body odor. Even today, bedouins perfume their hair with frankincense, and Yemeni women ward off evil spirits by burning it as they celebrate the birth of a child.

In A.D. 323, Emperor Constantine, in the grip of his new Christianity, declared that burial should replace cremation across the Roman Empire. That single event turned frankincense from the world's most valuable stuff into a commodity so cheap I could buy a bagful for two bucks. Founded three centuries later, Islam would find no particular use, either religious or medicinal, for the golden sap.

With the collapse of the incense trade, the civilization at its source crumbled, plunging into an obscurity that only Juris Zarins and his team would begin to illuminate.

During our coastal jaunt, we found more than a dozen ancient sites, but the two settlements that galvanized Zarins' interest were the gigantic tell at Jarub and the complex at Damqut. Both bore abundant evidence of occupation throughout the heyday of the incense caravans.

Yet it seemed unlikely that either of them was one of Pliny's eight oases. Why would camel drivers carrying goods to Jerusalem or Alexandria have forged the tortuous journey among the cliffs to Damqut, rather than cross the relatively easy desert between Shisur and Shabwa?

"In all probability," said Zarins, "there was more than one caravan route. I'm quite sure that frankincense was carried by boat as well as by camel." Indeed, we would later find an Iron Age petroglyph—a carving etched on a quartzite boulder—depicting a ship with small sails. Zarins had seen other Iron Age depictions of boats in Oman.

We returned to Al-Ghaydah, spent a grateful night in a ramshackle hotel in what may have been the only air-conditioned rooms in Mahra, then struck out for our exploration of the interior. For hours we drove across a featureless plain that shimmered in the heat. In the backseat of our Land Cruiser, Juri and Salim kept up a nonstop banter in Arabic. When Juri cried out "*Stenna!*," Salim, who knew almost no English, bellowed "Stoppah heah!" at our driver.

A Latvian native who had spent his first years in a German refugee camp, Zarins is a complex man. His graduate studies in the United States were interrupted during the Vietnam War when he was drafted into the Army. He won a Bronze Star. During our frequent stops to change a tire or fix a muffler, Salim practiced his marksmanship by firing his AK-47 at distant rocks. During the gunfire I noticed that Zarins became very quiet. George Hedges told me later that the sound of gunfire brought back the worst Zarins had seen in Vietnam.

Inland, the air was less humid, but the temperature soared. The first afternoon, our thermometer registered 112 degrees. A half-hour walk under the remorseless sun was all I could take before a kind of anxious haplessness took over. In Wadi Tinhalan, a bleak, dry riverbed in the Jebel al Fatk mountains, we stopped to admire several well-pre-

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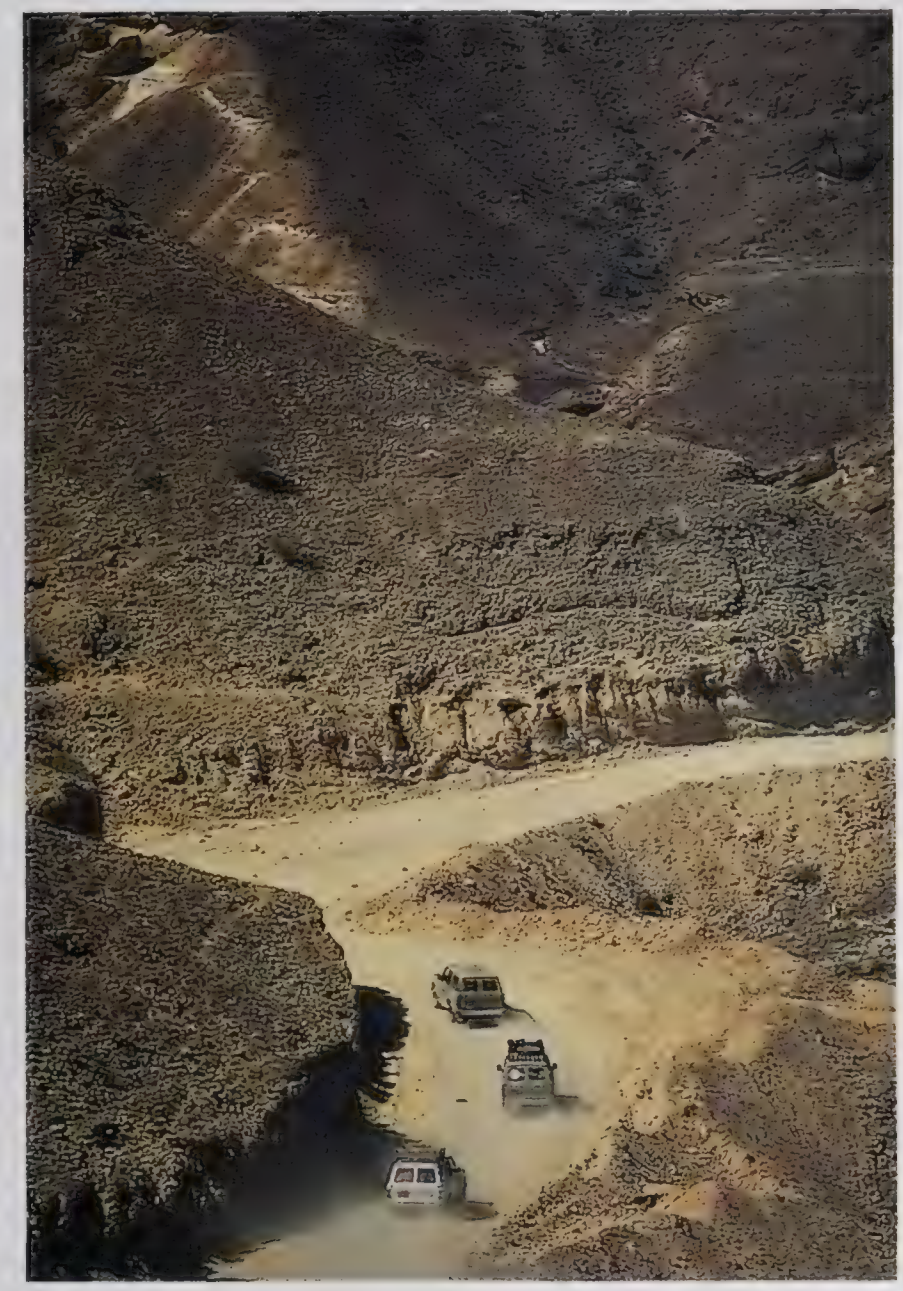
served rows of triliths. As I poked around, I discovered that one of the upright stones was carved with characters that looked like capital *A*, *B* and *K*, as well as the Greek theta and phi. I called the others over.

The road climbed through many switchbacks, emerging on a vast plateau stunning in its stark emptiness.



Though such finds are rare, Zarins had seen other trilith stones similarly inscribed. The alphabet is pre-Islamic and appears in the language that linguists call Epigraphic South Arabic. In the Yemen highlands, some inscriptions have been translated. But the language of these trilith runes is still undeciphered.

Here lay a clue. If, as Zarins believes, the underlying language of the inscriptions is Mahric, and if the language spoken by Salim's people has not drifted too radically in 2,000 years, the ancient writing might be deciphered by "reading it aloud" to native speakers. If these inscriptions could ever be understood, they might tell a great deal about the people who made them: what the triliths are all about, for starters.

Zarins is convinced that today's Mahra are the direct descendants of the ancients Pliny called "the richest races in the world." The inscriptions give evidence that the people were highly literate two millennia ago; yet nearly all of today's Mahra—goat, cattle, and camel herders—are illiterate. "Some event profoundly disturbed their culture," Zarins explained. "I'd guess it was the advent of Islam."

Nominally Muslim, the Mahra are at heart animists, as revealed in their persistent belief in djinns, the malevolent spirits that haunt dark places. The people's first language is a tongue called Mehri by linguists, one of six Semitic dialects spoken today in Yemen and Oman that have resolutely resisted corruption by Arabic.

Accustomed as we are to the ruins of Greece, Rome and Egypt, Zarins went on to explain, we expect great civilizations to leave monumental architecture. The Iron Age fort excavated at Shisur, made of mud bricks and mortared stones, was relatively humble by Roman standards. "But you can have a great civilization," said Zarins, "that built transitory dwellings, houses constructed of reeds and thatch and such, like the bedouins build today. Their real genius was for trade and commerce—and maybe for art and writing."

From Wadi Tinhalan, the dirt road climbed through many switchbacks, before emerging on a vast plateau 3,000 feet above sea level, stunning in its stark emptiness. We hurtled east. Old ruts of tire tracks branched everywhere, making the road a guessing game. As we drove, Ron Blom kept track of our progress on a set of huge Landsat photographs shot from space. These images were awash in vivid colors. Blom's interpretation of them had been crucial to finding the fortress at Shisur. He tried to explain to me how the photographs worked.

Each giant photograph represented several superimposed black-and-white images of the desert, shot at seven different wavelengths ranging from visible light well into near infrared. The satellite cameras thus "saw" far more than the human eye could. In the computer, Blom arbitrarily assigns colors to terrestrial patches of different reflectivity, to make those differences stand out.

He lost me as he explained how he could further tinker with the images by "dividing one band by another." It was this jiggery that revealed the ancient caravan routes converging on Shisur. The obvious problem was how to discriminate, in photographs shot from space, between ancient camel tracks and modern roads. Blom's answer: the ceaseless tread of camels over hundreds of years grinds the dirt and rock underfoot into finer particles than the crunch of mere decades' worth of rubber tires.

Advertisement

SEXUAL HEALTH

Most men will have an isolated erection problem at some time in their lives, but for others it happens more frequently. If the inability to respond naturally to your partner has become a recurring problem, you may be suffering from a treatable medical condition called erectile dysfunction (E.D.), also known as impotence. The following questions and answers are designed to give you a brief introduction to the causes of E.D. and the various treatment options available. If you believe you are suffering from E.D., or want to know more about the condition, talk to your doctor or other healthcare professional.

ERECTILE DYSFUNCTION: WHAT EVERY MAN SHOULD KNOW

WHAT IS E.D.?

Erectile dysfunction is the consistent inability to achieve and/or maintain an erection sufficient for satisfactory sexual activity. That means not just an occasional problem, but one that has been occurring repeatedly for a period of time. It's a widespread condition, shared by approximately 30 million men in the United States.

WHAT CAUSES E.D.?

It was once believed that E.D. is all in your head, or just an inevitable result of getting older. Actually, the majority of E.D. cases are associated with physical conditions or events, including some that are age-related. The most common risk factors for E.D. include:

- *Diabetes, high blood pressure, hardening of the arteries, or high cholesterol*
- *Injury or illness, such as spinal cord injury, multiple sclerosis, depression, stroke, or surgery for the prostate or colon*
- *Medications that may bring about E.D. as an unwanted side effect*
- *Cigarette smoking or alcohol/drug abuse*
- *Psychological conditions, such as anxiety and stress*

If you want to know more about E.D., talk to your doctor.

CAN ERECTILE DYSFUNCTION BE TREATED?

Yes. The good news is that, regardless of the cause, the vast majority of E.D. cases are treatable. Patients have a variety of treatment options from which to choose, including oral medication, hand-held vacuum pumps, self-administered injections, pellet suppositories, and surgical implants.

CAN ANYONE USE THESE TREATMENTS?

It's important to remember that these treatments are not for everyone, but only for men diagnosed with E.D. You and your doctor can determine the appropriate treatment for you.

HOW DO I KNOW IF I HAVE E.D.?

If you have erection problems, you probably already know it. But before your condition can be treated, you need to get a diagnosis from your doctor. There is no need to be embarrassed or ashamed when discussing E.D. with your doctor. He or she has probably diagnosed and treated E.D. many times but may not have discussed it with you out of respect for your privacy. Your doctor can provide you with understanding, support, and best of all, information.

To diagnose E.D., doctors typically ask a few specific questions and give a routine physical exam. This should help your doctor arrive at a diagnosis.

Based on this information, you and your doctor will decide on the treatment that is best for you.

REMEMBER:

E.D. is a common medical condition.

It's not an inevitable result of growing older.

E.D. is treatable with a variety of methods.

Only your doctor can prescribe the appropriate treatment.

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From the Landsat photographs, and from Zarins' perusal of travelers' accounts both in European languages and in Arabic, the team had settled on two goals for our foray: the town of Habrut, near the border with Oman, and a spring (reported by the indefatigable Wilfrid Thesiger in 1948) at Sarif. Like Ptolemy's Iobaritae, the very name Habrut, Zarins guessed, might embody an ancient echo of Ubar.

Three days into our headlong journey, at the end of a marathon traverse of dry wadis and scorched plains, we reached Habrut. A thick stand of date palms proclaimed the hidden spring that had made this oasis habitable for more than 3,000 years. Zarins quickly located the "old fort" previous travelers had reported.

It was not much to look at: an eroded mound of mud bricks bleaching in the sun. We straggled across the site just after noon on our hottest day yet.

We worked about 40 minutes before retreating to the shade of the palms. I sat in the dusty gloom, guzzling water, wiped out by our sixth day of frantic driving, disappointed in the ordinariness of the ruined fort. But Zarins was in ecstasy: he had found his burnished redware from the Iron Age, and on his next expedition he hoped to confirm his hunch that Habrut—only 35 miles due southwest of Shisur—was another of Pliny's eight oases.

Our next destination was Sarif. We knew little beyond Thesiger's laconic mention that the water in the spring was good. We reached the site just before sunset. George Hedges had gone ahead to scout out a campsite. In the late-afternoon haze, the road petered out on a bedrock shelf. Just then, I saw Hedges, red-faced and sweating, running toward us.

"Juri, come here!" Hedges shouted. "This is the most amazing place we've ever seen!"

We followed Hedges and without warning came to a precipice that overhung 200 feet of empty space. A huge crater in the plain, like some hanging valley out of Conan Doyle's *The Lost World*, gaped beneath our feet. At the bottom of the pit, giant palms and figs shaded two crystalline pools of water.

We spent three days at Sarif, trying to fathom its meaning. Multiple rows of triliths, oriented along the line of the summer solstice, marched toward the precipice. Large stone rings topped a nearby crest. And everywhere we found Bronze Age tombs. The mightiest was a big rectangular platform, surrounded by five smaller satellite tombs. "Some very important person must have been buried here," Zarins mused. "He got special treatment."

We found, toppled among the tombs, five megalithic stelae—four-foot-high stone slabs, carefully shaped, their faces carved with abstract figures. Though the carvings were eroded, we could still see the delicate traces of beards, necklaces, belts and crescent-headed daggers. The top of each stela bore the raised relief of a stylized head and arching arms. Perhaps these were gods, though Zarins guessed the stelae honored real people—kings, heroes, priests.

On the second evening, as we sat in camp after dinner, Zarins summed up the significance of Sarif. "In the Neolithic, this country was wet—people lived along streams and lakes. Around 2500 B.C., they ran into trouble. Their world dried up. The people faced a choice—either become pastoralists dependent on the camel to move from one oasis to another, or retreat to places like Sarif, where a permanent aquifer guaranteed good water.

"I'm convinced," continued Zarins, "that the incense trade began in the Neolithic Age. Before they domesticated camels, the ancients carried incense by foot, then by donkey. Sarif was a rest stop from 4000 B.C. through the Iron Age.

"We haven't found the village yet—only the tombs and the triliths. There has to be a village—dead men don't need to drink. We'll find it when we come back."

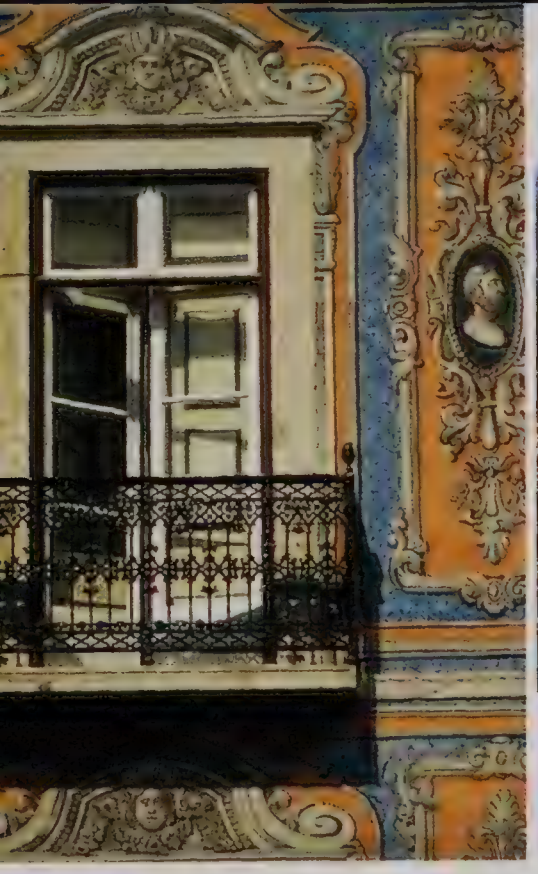
Zarins took a sip of sweetened tea. "I don't like to go overboard, but this is a major find."

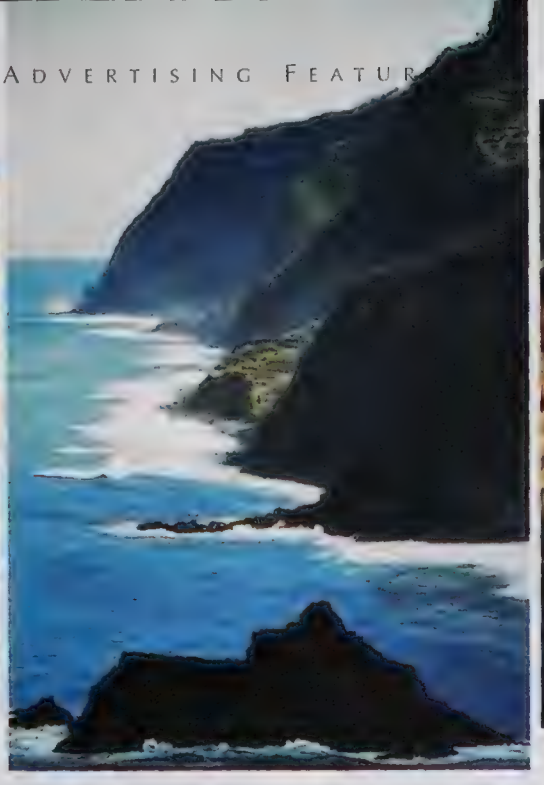
In all the stern and forbidding beauty of Mahra, Sarif stood out. Addicted to the precipice that guarded its oasis, I pitched my tent on a limestone promontory.

On the last morning, I sat on my perch before dawn and pondered the enigma of Sarif, realizing with a pang that I probably would never see the place again. My thoughts wandered back to those vanished traders who had carved the Bronze Age stelae—Pliny's Scenitae, Ptolemy's Iobaritae, Salim's long-lost ancestors, whoever they were. On our pell-mell jaunt through a wilderness unknown except to its inhabitants, we had scratched the surface of a great conundrum written in rocks and sand. I envied Juris Zarins the years of discovery that lay ahead.

David Roberts, a frequent contributor, wrote about Mexico's Copper Canyon in May. Photographer Kay Chernush has covered subjects for SMITHSONIAN *ranging from shipbreakers to concrete to cheese.*

A quartzite rock (above) found near Al Ghaydah reveals an Iron Age etching of a boat that may have carried frankincense. In the hidden valley at Sarif, spring-fed ponds (right) have been cooling weary desert travelers for 6,000 years.





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The Algarve's white-sand beaches. Urban sophistication and the charming old-quarter streets of Lisbon. The countryside of Northern and Central Portugal. Alentejo's golden plains. And the sapphire-blue lakes of the Azores. Or the island of Madeira with it's steep cliffs and panoramic views. But there's so much more to Portugal! Just take a look!

FOR THE CONNOISSEUR, THE CULTURE BUFF, THE HISTORIAN

When it comes to cultural riches, Portugal is a treasure trove. Vestiges of prehistory exist throughout Portugal — Jurassic traces, dinosaur footprints, stone- and iron-age objects. Lisbon's Archaeology Museum is renowned for its Celtic collection alone. And, of course, centuries of maritime expeditions and exploration have been a motif in Portuguese porcelain, portraiture, and sculpture.

Architecture aficionados find variety among Portugal's cathedrals, monasteries, and basilicas, exhibiting Renaissance, Manueline, Neo-classical, and other styles. And Portugal's array of museums range from the cutting-edge Modern Art Center *José de Azeredo Perdigão*, housed at the Calouste Gulbenkian Foundation in Lisbon, to Barcelos' Museum of Ceramics, to the magnificent handicrafts and tapestries displayed in the typical *Institute of Embroidery on Madeira.*

A LAND WITH A RICH FOLK HERITAGE

Few countries offer the variety of authentic folk heritage that Portugal does. Consider the breathtaking azulejos, the bright, painted tiles that decorate building facades and highlight Portugal's stunning architecture. The word derives from "al zuleiq," Arabic for a small polished stone. Portugal's tile tradition traces back to the Moorish presence during the Middle Ages.

Or consider the dozens of markets, fairs, and gatherings offering traditional Portuguese arts and crafts year-round — *Arraiolos* carpets from the 17th century (Alentejo); bedspreads and wall hangings from Castelo Branco in Beiras - Centro de Portugal; ceramics and pottery from Barcelos (Porto e Norte de Portugal); famed embroidered linens from Viana do Castelo; Copperware from the Algarve, and much, much more. Even the mystical Fado — the poetic troubadour songs of sadness or celebration — is one of the masterpieces of the folk tradition!

Photo credits clockwise from upper left: João Paulo, Eça, José Manuel, João Paulo, José Manuel, José Manuel, A. Sacchetti, Portuguese National Tourist Office.

EXPO '98: THE FUN GOES ON!

It will be remembered as the last World's Fair of the twentieth century. It's theme was "The Oceans," and not only vividly recreated habitats teaming with marine life from around the world, but also offered exhibits on history, sailing, exploration, navigation, ecology, and telecommunications. The good news: many EXPO '98 facilities remained as permanent attractions! They include:

THE OCEANARIUM. The largest aquarium in Europe, built by the American architect Peter Chermayeff, features the Antarctic Ocean, an Indian Ocean coral reef, a rocky pacific coast line, the Azores' Atlantic coast, and a natural tank with a wide variety of deep-sea species. The Oceanarium houses 25,000 examples of 300 different species.

THE UTOPIA PAVILION. An indoor stadium with sophisticated theatrical equipment, the Pavilion accommodates 15,000 people, and is now Lisbon's first multipurpose arena for concerts, sporting events, theatrical shows, and international conventions and meetings.

As a result of EXPO '98 the new LISBON EXHIBITION CENTER hosts dozens of international fairs each year, along with the RECREATION HARBOR, with a capacity of 700 to 900 pleasure crafts. The fun didn't end with EXPO '98!

POUSADAS DE PORTUGAL Experience Portugal's history and still luxuriate in the present. Stay in Pousadas de Portugal, — the magnificent monasteries, convents, castles, and estates that are now beautiful hotels. Pousadas are a grand Portuguese tourism tradition, and an amazingly affordable way to steep yourself in historically significant landmarks as you savor Portugal's sights, sounds, and flavors. Portugal is known for fabulous food and Pousadas offer authentic dining experiences and many culinary delights.

Or, stay in one of Portugal's *solares* — splendid homes ranging from stately manor houses to elegant country homes and rustic cottages, each with its own individual character. It's a different holiday experience — with a real personal touch!

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Farther north, in Porto e Norte de Portugal region, play at Ponte de Lima, with its views of vineyards and orchards; at Estela, host of two events in the European Professionals' Circuit; or at legendary Miramar, framed by ocean vistas.

In central Portugal, the exclusive Golden Eagle course; the Algarve region's "Penina" course; the most brilliant project of Sir Henry Cotton; the Azores' stunning "Furnas" course and Madeira's fabulous Palheiro course are all world-class golf destinations. Coming to Portugal? Bring your clubs!

JOURNEY TO JEWISH PORTUGAL Portuguese culture is deeply tied to the rich history of its Jewish communities. In the fifth century, when Visigoths dominated the region, Jewish philosophers, writers, and scientists lived in Portugal. In subsequent centuries, academic, financial, and commercial contributions of Portuguese Jews have been inestimable.

Surviving persecution, expulsion, and Diaspora, Portuguese Jews have played enormous roles in discovery and exploration, cartography, mathematics, medicine, and literature. During World War II, Portugal was a safe haven for Jews fleeing the Holocaust. Recent years have seen such landmarks as rededication of the famed Jewish Cemetery in Faro; the laying of the foundation stone of a synagogue in Belmonte; and the organizing of a seminar on "Jews and Arabs of the Iberian Peninsula," under the auspices of UNESCO.

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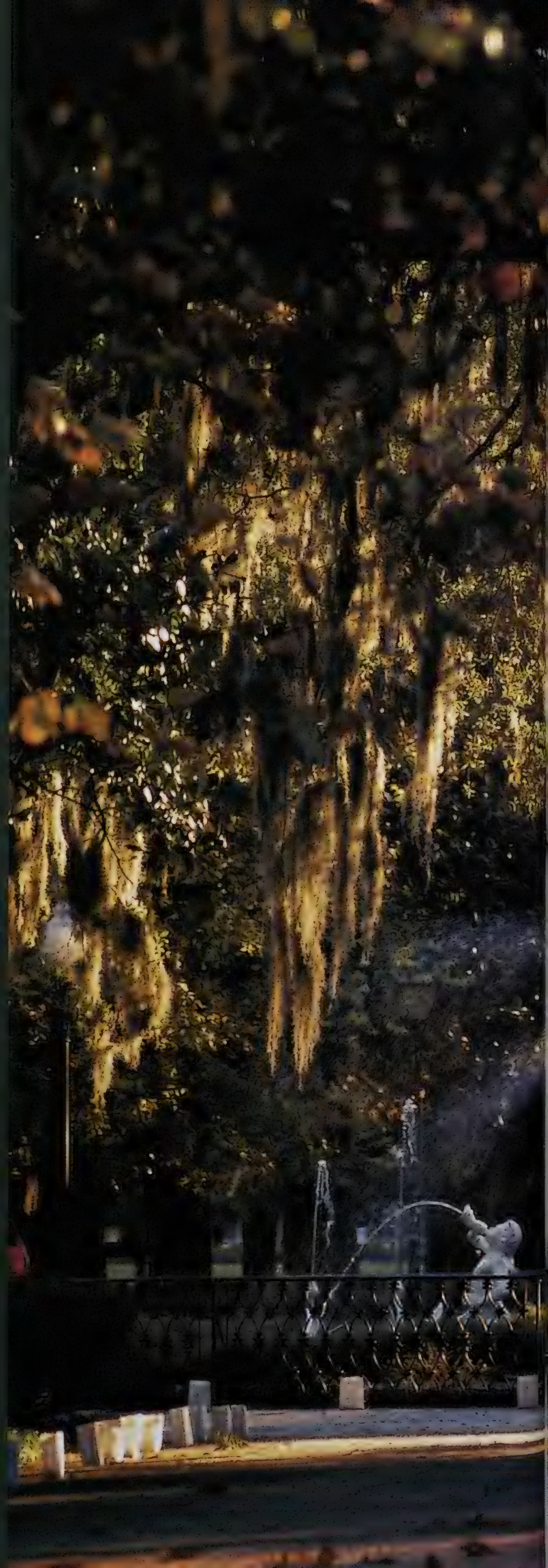
Portugal

GEORGIA'S FOUNDING FATHER KNEW BEST, BUT SAVANNAH DIDN'T STAY UNSINFUL FOR LONG

Dawn *in the* Garden of Good & Evil

BY PATRICIA O'TOOLE

James Edward Oglethorpe, the colony's high-minded leader, laid out the city in spartan rectangles, a far cry from Savannah today.



SAVANNAH, GEORGIA, USED TO BE LIKE ANY NUMBER OF great-aunts in any number of Southern families. Everyone knew of her existence, maybe even had heard tell of her good looks and idiosyncrasies, but few roused themselves to make her acquaintance. Then came John Berendt, a New Yorker who parked himself in Savannah, learned her secrets and confided them to the world in *Midnight in the Garden of Good and Evil,* a record-breaking best-seller. In the United States there are 2.5 million hardcover copies in print. It has spawned *Midnight* the movie, *Midnight* the television documentary and, in Savannah, *Midnight* the bus tour and the gift shop.

Berendt hangs his tale on the death of a young tough, Danny Hansford, and the ensuing legal battles of the man who shot him, Jim Williams, a middle-aged tough with a high-gloss veneer. Williams owned Mercer House, one of Savannah's grandest mansions. *Midnight* is also a journey into Savannah's soul, long artfully concealed from outsiders. The city's extravagant beauty—the graceful antebellum houses fronting picture-perfect squares, the ubiquitous magnolias, the oaks in Spanish moss ruffles—turns out to be the ultimate mask, displaying much while revealing little. And the preternatural charm of the inhabitants turns out to be a shrewd strategy for keeping strangers at arm's length: look a visitor in the eye, turn on the honey, and he'll go away thinking he knows you. A city of secrets, that was Savannah before *Midnight.*

But Savannah didn't start out that way. In the dawn of this garden of good and evil, Savannah was supposed to be an open book. And its story, penned by an altruistic young English aristocrat named James Oglethorpe, was supposed to close on a high-minded, happy-ever-after note. In 1732, concerned about the swelling ranks of the poor in London, Oglethorpe and 20 other public-spirited English gentlemen thought they had figured out how to annihilate poverty and create paradise in one bold stroke. They would export the poor to a new American colony, give them land and seed money, and keep them solvent by purchasing the fruits of their labor (hemp, flax, wine and raw silk). Oglethorpe, who would lead the colonization, promised that the indigent would "immediately find themselves in possession of a competent estate, in a happier clime than they knew before."

Eager to improve the morals as well as the fortunes of the poor, the founders banned hard liquor from their new colony. They prohibited slavery, too, partly for humanitarian reasons but also from a suspicion that use of slave labor would promote the very laziness that they hoped to stifle by giving the poor a demanding gift of wilderness.

The gentlemen selected the last unclaimed chunk of North America's Atlantic Seaboard for their Eden,

In London in 1734, the approving Trustees of the Colony of Georgia play host to Oglethorpe (center, in black) and an entourage of Indians led by Chief Tomochichi, arm extended toward his young son, Toonahowi, who was dressed in European clothes.

BOB KRIST

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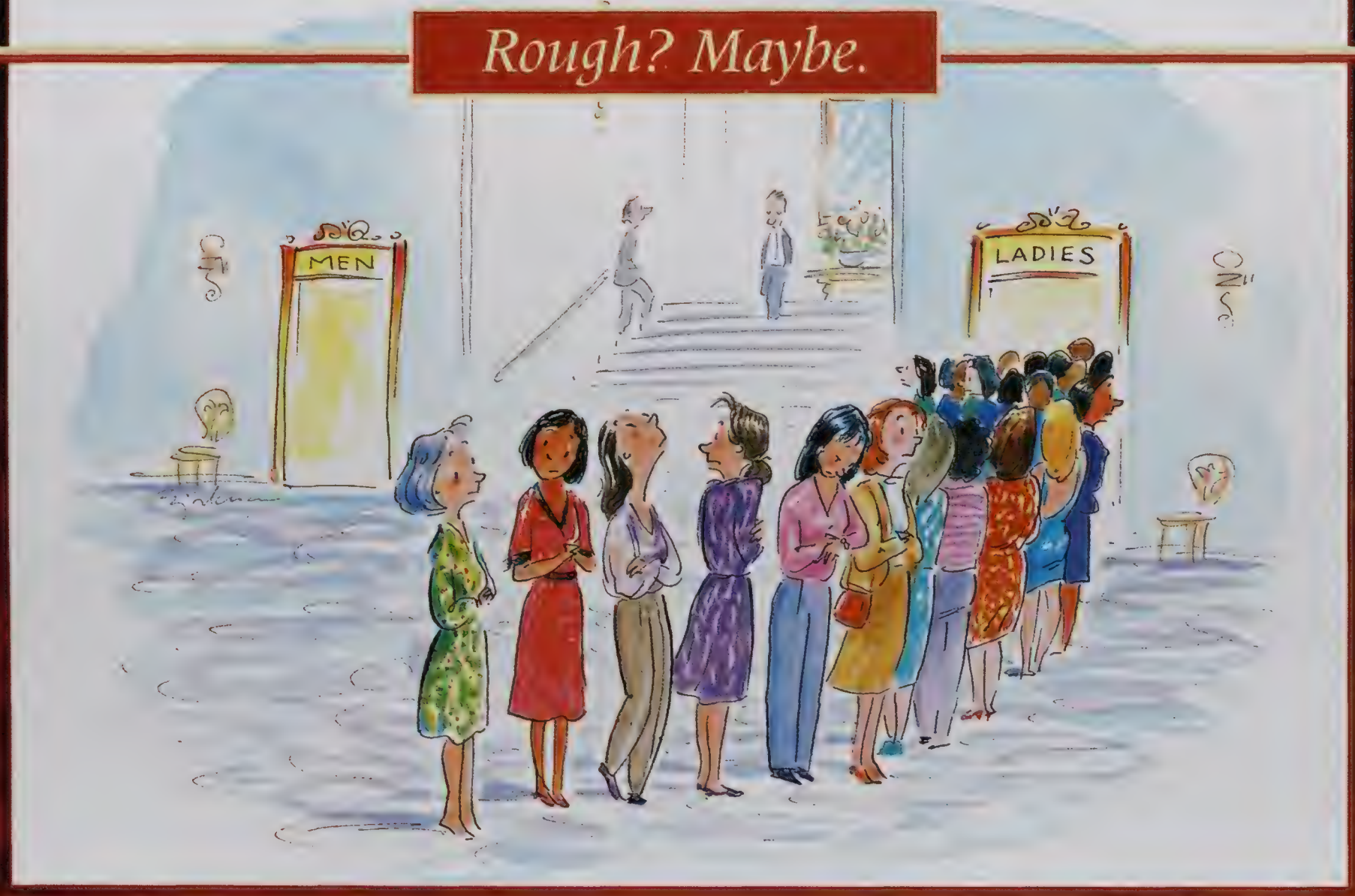
christening it Georgia in honor of His Majesty George II. Although none of them had been there, they knew Scottish explorer Sir Robert Montgomery's description of the region as "the most amiable Country of the Universe"—blessed with a balmy climate, a seemingly infinite supply of fish and game, and soil said to sprout seven-inch ears of wheat.

Hoping that most of the colony's wealth would accrue to the colonists rather than the investors, the founders generously chartered Georgia as a trust. Instead of selling shares in the enterprise, as many other American colonizers had done, the trust wished to finance Georgia solely through parliamentary appropriations, lotteries and donations. An early fundraising pamphlet estimated that a £20 gift would carry a man to Georgia, equip him with clothing and tools, and feed him for a year. After that he was expected to be self-sufficient.

The founders were to oversee Georgia's affairs from London, a two-month sea voyage away, but forbade themselves to own so much as a silkworm, to keep their private interests from conflicting with the public good. *Non sibi, sed aliis,* read the motto on their seal. "Not for self, but for others."

As Georgia prospered, England would gain new commodities for manufacturing and trade. Government spending on the poor would drop. A Georgia full of Englishmen would make the Spaniards in Florida think twice about marching against the British colonies farther north. And, at last, the empire would have its own supply of raw silk, putting an end to imports from places like Italy, France and China, which cost the country £500,000 a year.

James Oglethorpe's biographers have complained, justifiably, that he is a terribly hard man to get to know. Many of Georgia's early records have been lost—some in a fire, some in transit for safekeeping during the Revolutionary War, still others through a boneheaded decision in Savannah in this century, when old documents were tossed out to make room for new. It *is* known that James Edward Oglethorpe was born in London in 1696, the ninth and last child of a member of Parliament and brigadier general. Schooled at Eton and Oxford, he ultimately rose to the rank of general in the British Army and, like his father and two brothers before him, won election to Parliament. He became known as a reformer, exposing the horrors of the nation's jails and actually convincing Parliament to free 10,000 prisoners who had committed



Oglethorpe's plan for the city was this grim grid, set in a clear-cut rectangle of forest.

GRANGER COLLECTION

the criminal offense of falling into debt.

Generations of history textbooks perpetuate the myth that most Georgia settlers were convicts, but in fact, only a few had been to prison. Twenty-three of the roughly 115 passengers on the first voyage were children. Among the adults were carpenters, merchants, a tailor, a gardener, makers of stockings and wigs, a miller, a baker, a sailor, an Anglican clergyman, a surgeon and a master silkmaker from the Piedmont region of Italy. The first Georgians set sail from Gravesend, on November 16, 1732. The voyage, aboard the 200-ton ship *Anne,* showed Oglethorpe at his best. To judge by the feasting and toasting recorded in the ship's log, he shared Jim Williams' passion for parties. He liked soldiering and readied the men to defend the colony by drilling them with firearms and bayonets. He caught a dolphin and gave his portion to the pregnant women on board. When scuffles broke out, he brokered the peace and restored the company's cheer with a round of ale. At 36, Oglethorpe was probably not that much older than most of his charges, but they referred to him as "Father."

On February 1, 1733, the *Anne* dropped anchor at the base of a 40-foot-high bluff, about 15 miles up the Savannah River from the Atlantic. The landing spot was most likely somewhere under what is now the

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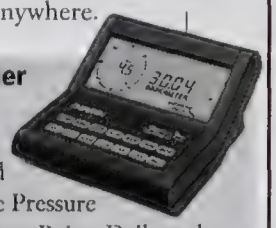

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Sources of recent Savannah notoriety: John Berendt, author of *Midnight in the Garden of Good and Evil*, the Mercer mansion, and Lady Chablis, who figures in both book and movie.

Hyatt Regency Hotel, less famous today for Oglethorpe's arrival than for a wicked scene in *Midnight in the Garden of Good and Evil*. (It was here that the Lady Chablis, an African-American transvestite who sashays in and out of Berendt's story, crashed one of Savannah's most decorous parties, the black debutante ball.)

On the first day a delegation of Yamacraw Indians dropped by and declared their peaceable intentions. Given the variously savage and sorrowful history of relations between North American natives and European immigrants, it is startling to learn that the elderly Yamacraw chief, Tomochichi, expressed three desires for his people: land among the settlers, education in the white man's school and instruction in Christianity.

Scanning the "Landskip" from the bluff, Oglethorpe found the terrain handsome and healthy. But much as he enjoyed gazing at lush forests, the Savannah of his dreams was a tabula rasa. A map made in 1734 shows the new hamlet shaved clean of trees except for two quartets of long-legged pines at the first of the many equally spaced squares called for by the hypergeometry of his plan. The trees did not give a nickel's worth of shade. To rest out of the sun or steal a smooch or a snooze, the first Savannahians would have had to head for the woods at the edge of town, in full view of the rest of the villagers. Every residential lot was 60 by 90 feet and stockade-fenced. Along every street, each lot had the same wooden cottage drilled into exactly the same position. Dead-center on each bare facade was a door flanked by two windows. The town looked like a penal colony. Voluptuousness, the insignia of modern Savannah, lay in a future unimagined by foursquare James Oglethorpe.

Oglethorpe laid out Savannah's first streets and its first six squares, which he plunked into the middle of the principal intersections on Bull, Barnard and Abercorn streets. Near the first, Johnson Square, named for South Carolina's helpful governor,

MORRIS BEST/UNIPHOTO; BOB KRIST

BOB KRIST

Oglethorpe situated the public stores and the public mill.

What is now known as Wright Square came next, and when Chief Tomochichi died, in 1739, Oglethorpe buried him here with honors. Johnson and Wright squares were followed by Ellis (blotted out today by a parking structure at the eastern edge of City Market, a popular enclave of shops and restaurants), Telfair, Oglethorpe and Reynolds.

Eighteen later squares—including Monterey, where Jim Williams shot Danny Hansford—followed the same design, so James Oglethorpe still sets the rhythm of Savannah's drivers, forcing them to slow every few blocks and jog right, left, left, right, to cross from one side to the other.

Savannah's city plan matched the rectitude and precision of Oglethorpe's inner being. Though they required constant reports, the trustees nonetheless essentially left him free to govern as he saw fit, and he did. The settlers seemed grateful at first. One wrote home to England that Oglethorpe was "both great and good" and predicted that in spite of runaway hogs, ants that "bite desperately" and a few "Grumbletonians" in the colonists' ranks, "there is no room to doubt but that we shall be a flourishing people."

The Grumbletonians quickly multiplied. By summer, Father informed London that his children were growing "mutinous and impatient of labor and discipline." There was a good deal to be mutinous about. Instead of the "competent estate" Oglethorpe had promised for each, many settlers found themselves in possession of land either too sandy or too swampy for farming. The work of clearing the land was "tegious" and expensive because hired hands "insist and will have so extravigant a price," John Terry complained. Noble Jones, the colony's surveyor, was a busy and distractible fellow, and although he laid out an exquisite 500-acre estate for himself at Wormsloe, on the outskirts of Savannah, he took his time elsewhere, leaving many settlers unsure of their property lines. Unable to fence because of unclear boundaries and a shortage of labor, many of the colonists saw crops destroyed by wandering livestock.

Only 15 of the 149 men who arrived in 1733 had any agricultural experience, and even for those who did, the work that lay ahead was long and frustrating. Some crops came up, but no seven-inch ears of wheat materialized. Plows had been mysteriously left behind in England. "I despair of ever doing any great matters by pecking with a hoe," Isaac Gibbs wrote the trustees; "...it might be of very great service to the colony if your honors would please to assist them with a few English plows for I am sure that one man and a boy with but a couple of oxen or horses shall do more than ten men with their hoes."

Public-spirited English gentlemen thought they had figured out how they could annihilate poverty.

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The colony's ban on hard liquor does not seem to have kept anyone from drinking. Rum was easily purchased from South Carolinians, who lived just across the Savannah River and obligingly delivered by night or came grinning by day with casks marked "cider." The ban had two consequences, both unintended: it made scofflaws out of most of the populace, and it penalized the economy, because a great deal of money that might have stayed in Georgia flowed to South Carolina.

When more settlers began to arrive, few comported themselves as Oglethorpe wished. A day after debarking from the *Georgia Pink*, Mary Preston, pregnant and newly widowed, was arrested for picking the pocket of a man lost in a fog of rum. "Many of the newcomers, in spite of all I can do, drink very hard," Oglethorpe sighed in a letter to the trustees. Long a foe of hard liquor, he believed it spoiled mother's milk, and he worried about the hazards of mixing strong drink with Georgia heat.

Even more distressing to Oglethorpe was that the colonists quickly began clamoring for slavery. Seeing slaves at work for South Carolinians who crossed the river to visit Savannah, the Georgians immediately grasped the advantages of being able to have others do their work in the broiling sun. But Oglethorpe's first few months in Savannah reinforced his natural opposition to slavery; he also reckoned that if prosperous Georgians acquired slaves, the low cost of slave labor would put poor whites out of work.

Despite these disappointments, before the first year was out, Savannah's population had reached 259, some 50 houses were up and a lighthouse was under construction near the mouth of the Savannah River. "Providence it self seems visible in all things to prosper your Designs," Oglethorpe wrote the trustees toward the end of 1733. He had secured an

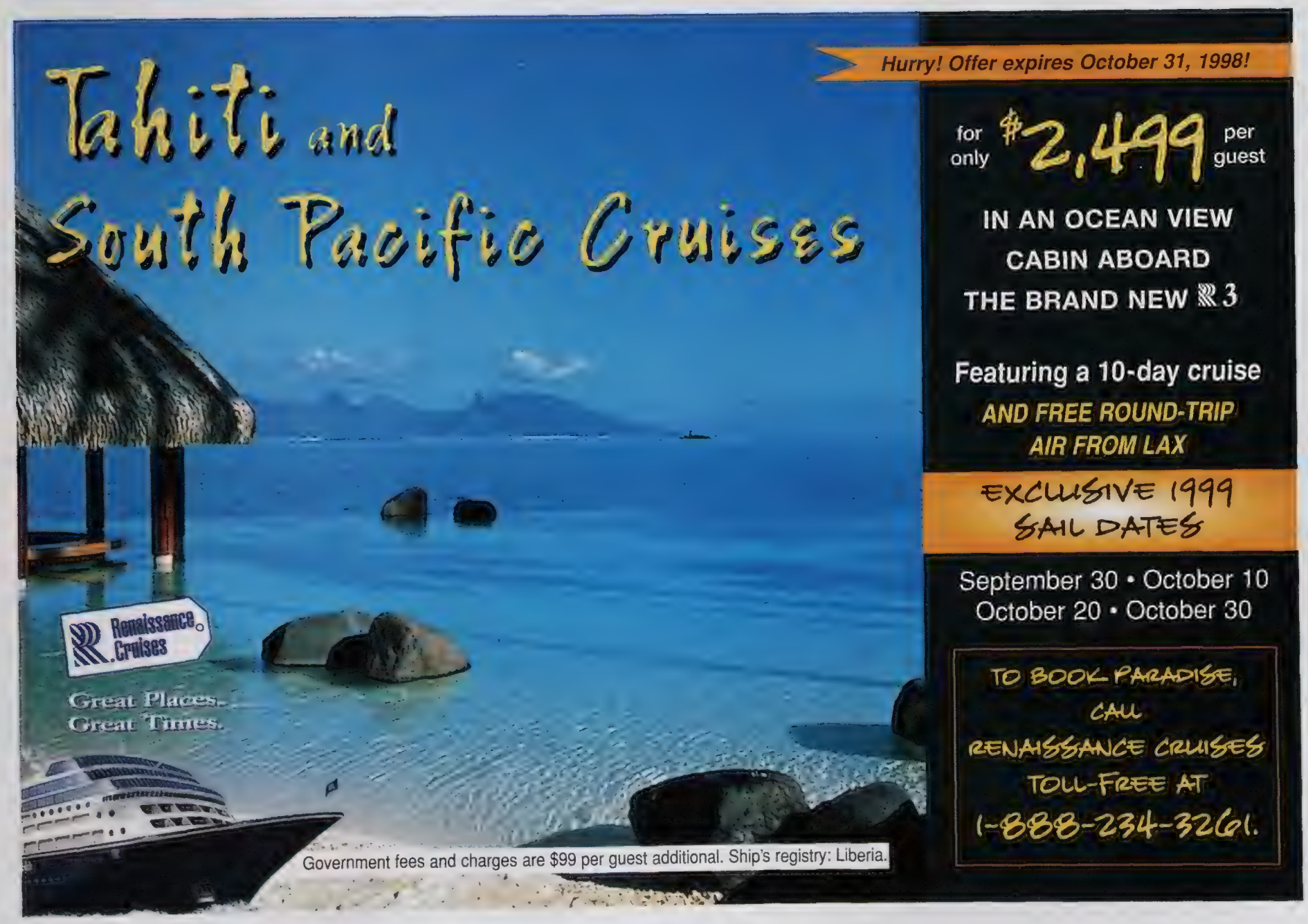
alliance with the Creek Indians, cajoling them into ceding England all the lands they did not use—thousands of square miles. And he had established a ten-acre public garden as a nursery for vegetables, fruits and mulberry trees. The garden long ago disappeared, but Pirates House, a restaurant in a wooden building that has stood on the site since the late 18th century, still does right nicely by vegetables, fruits and wine.

Still the colonists' discontent grew. Savannah had a communal store, established by the trustees to alleviate the chronic shortages of wilderness life, and to provide subsistence to settlers in their first year. But sometimes it was empty and sometimes provisions went bad; worldly merchants from other colonies often exploited the Georgians' inexperience by price-gouging and selling them inferior goods. Shut out of the store entirely early in 1734, when their credit had run out, some settlers found themselves obliged to sell household goods for bread. The store had advanced a cow and a sow to Samuel Perkins, but the cow died and the sow proved barren. Drafted to fight the Spanish at an inopportune moment, he returned home to find that his crops had perished, a fate undoubtedly suffered by others. The trustees responded to individual cases of need by extending the period of subsistence or by issuing basic items on credit. Still, many went without food and supplies.

"In spite of all I can do," Oglethorpe sighed, many of the newcomers "drink very hard."

Some historians have wondered whether Oglethorpe overestimated the Spanish threat, and he may have, but his fears were not groundless. For reasons too stupefying to enumerate, Spain and England spent most of the 1730s and 1740s at each other's throats. The friction prompted Oglethorpe to order construction of bastions all along the coast (including Noble Jones' fortified house at Wormsloe, now a state historic site).

In 1740 Oglethorpe attacked the Spanish in St. Augustine and was trounced. Two years later, when the Spanish laid siege to Georgia at Frederica, Oglethorpe fought at the front, captured two enemy soldiers with his bare hands and won the battle. Like a number of North Americans over the years, he had longed to seize Havana, but Parliament, which rarely voted enough funds for Georgia's defense, showed no inclination to en-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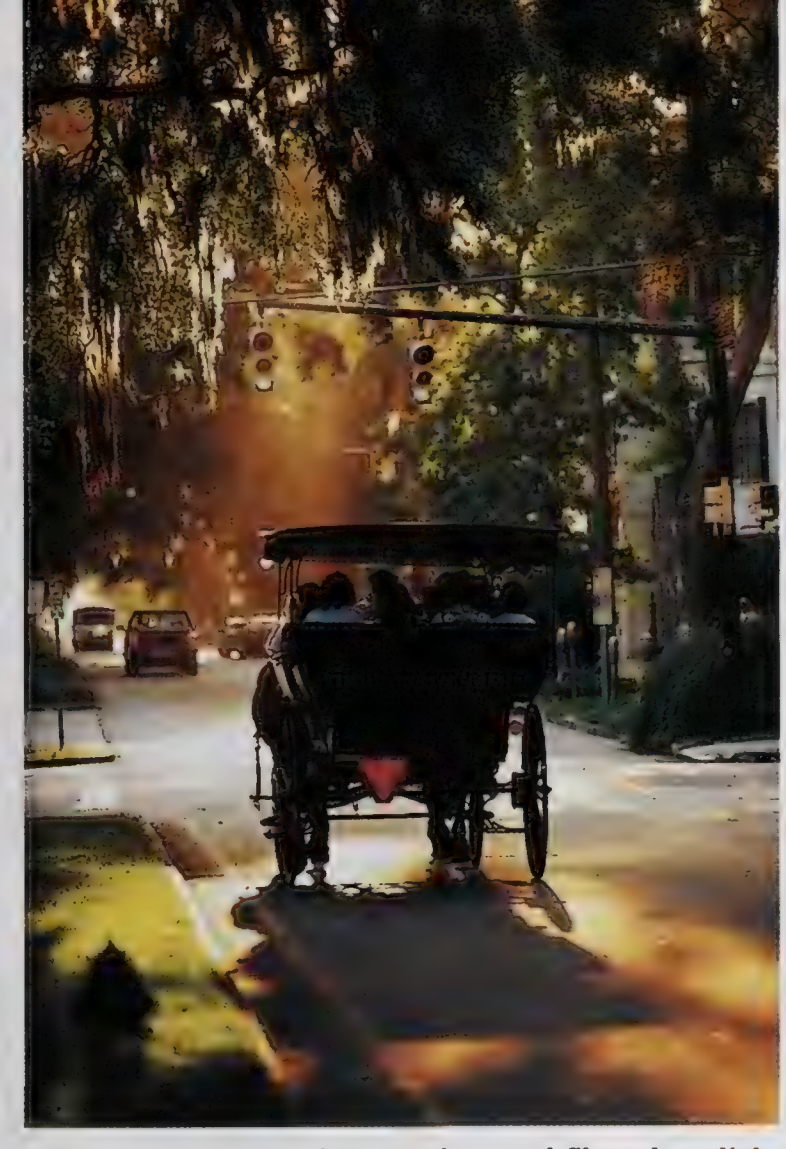
courage Oglethorpe's grander military schemes.

Even before these military distractions, Hugh Anderson felt obliged to inform the trustees that Savannah was "Decaying and Desolate The greater number of its inhabitants dispers'd ... to Shun Misery and Famine, the Remainder Dispirited and in want of Common necessarys of Life." Two of Anderson's servants had skipped out on their indentures, and several members of his family had died. Reckoning that he had spent £150 and earned only £6, he said he hoped that few of his fellow colonists had suffered such great misfortune.



Spanish moss, an antique carriage and filtered sunlight gild Savannah's glossy image.

The settlers' deepest resentments flowed from restrictions on landownership. Oglethorpe and his London colleagues, sensing that penniless colonists could easily slip into debt, had taken numerous measures to protect the colonists' real estate. Property could not be used as collateral for loans. Nor could it be sold, a rule that seemed wise since it was meant to suppress landgrabbing and speculation. Also, to make Georgia a society of small farmers and keep settlers close to one another in case of attack, no one was permitted to own more than 500 acres. To further limit private ownership, land could be inherited only by sons, precluding the possibility of amassing more real estate through marriage. Land not inherited would revert to the trust.

Without the right to mortgage their land, settlers were deprived of the usual means of securing the credit needed, in bad years, to survive from one harvest to the next. For landowners with no sons, there was little motivation to improve land; but even those with heirs found improvements hard to make. "I must tell you," Isaac Young wrote in 1738, "it's hard living here without a Servant, one man being incapable to move Trees, & fence, with other necessary labours that one must go through before he can plant." If the colonists were indeed safe from the temptation to speculate on land, they were also trapped. John Brownfield, struggling to convey the urgency of the need for more flexible landholding rules, told the trustees, "However weak these arguments are, I do assure your honors that the greatest number of people here are guided by them."

Seeming to have sense and virtue on his side, Oglethorpe refused to budge. Almost everyone in Savannah was in hock to a pair of rum peddlers, he explained to the trustees in 1739. If property could be sold, the bootleggers would "take the Lands for their debts, monopolize the Country and Settle it with Negroes." Slavery would "occasion the Misery of thousands in Africa," and large planters would squeeze out the yeomen farmers who were supposed to be the mainstay of Georgia.

Oglethorpe was inclined to blame the colonists for their difficulties. He was not alone. The persistent poverty of the settlers led one trust official to sniff that persons who had been "useless in England were inclined to be useless also in Georgia." But even the diligent despaired of improving their fortunes. Walter Fox, Savannah's official gunner, complained in 1741 that his post demanded much of his time but paid little. "I was always Promised that the Honorable Trustees would Certainly Settle a Salary or order me Satisfaction for my trouble: but I never have received any thing though I have charged 40 Pounds Sterling for four Years' service."

Of the nearly 3,000 people who settled Georgia during its first decade, about 1,010 English emigrants and 840 European Protestants fleeing religious persecution were sent "on the charity." Nearly 700 more came with their own money, as private adventurers. At least 400 more signed on as indentured servants, typically for a period of four or five years. With their own money at risk, the private adventurers worked hard. So did the Europeans, who seemed genuinely thankful to have been given freedom to practice their religions.

Meanwhile, the English charity colonists and indentured servants displayed little of the gratitude or industry hoped for by the trustees. Indolence, insubordination and inebriation became epidemic. Servants regularly ran away to other colonies before serving out their time. Oglethorpe convinced himself that Georgia was lucky to be shut of them. Women servants sent on the charity were particularly "burthensom," in his opinion. Only a few "mended the clothes, dressed the victuals and washed the linen," as they were supposed to. The rest were "a dead charge to the trust." When soldiers asked for permission to marry several of these women, Oglethorpe quickly assented, happy

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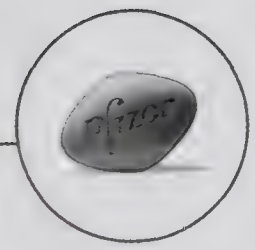

Brief summary of prescribing information

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INDICATION AND USAGE

VIAGRA is indicated for the treatment of erectile dysfunction. The studies that established benefit demonstrated improvements in success rates for sexual intercourse compared with placebo.

CONTRAINDICATIONS

Use of VIAGRA is contraindicated in patients with a known hypersensitivity to any component of the tablet. Consistent with its known effects on the nitric oxide/cGMP pathway (see CLINICAL PHARMACOLOGY), **VIAGRA was shown to potentiate the hypotensive effects of nitrates, and its administration to patients who are concurrently using organic nitrates in any form is therefore contraindicated.**

PRECAUTIONS

General

A thorough medical history and physical examination should be undertaken to diagnose erectile dysfunction, determine potential underlying causes, and identify appropriate treatment.

There is a degree of cardiac risk associated with sexual activity; therefore, physicians may wish to consider the cardiovascular status of their patients prior to initiating any treatment for erectile dysfunction.

Agents for the treatment of erectile dysfunction should be used with caution in patients with anatomical deformation of the penis (such as angulation, cavernosal fibrosis or Peyronie's disease), or in patients who have conditions which may predispose them to priapism (such as sickle cell anemia, multiple myeloma, or leukemia).

The safety and efficacy of combinations of VIAGRA with other treatments for erectile dysfunction have not been studied. Therefore, the use of such combinations is not recommended.

VIAGRA has no effect on bleeding time when taken alone or with aspirin. *In vitro* studies with human platelets indicate that sildenafil potentiates the antiaggregatory effect of sodium nitroprusside (a nitric oxide donor). There is no safety information on the administration of VIAGRA to patients with bleeding disorders or active peptic ulceration. Therefore, VIAGRA should be administered with caution to these patients.

A minority of patients with the inherited condition retinitis pigmentosa have genetic disorders of retinal phosphodiesterases. There is no safety information on the administration of VIAGRA to patients with retinitis pigmentosa. Therefore, VIAGRA should be administered with caution to these patients.

Information for Patients

Physicians should discuss with patients the contraindication of VIAGRA with concurrent organic nitrates.

The use of VIAGRA offers no protection against sexually transmitted diseases. Counseling of patients about the protective measures necessary to guard against sexually transmitted diseases, including the Human Immunodeficiency Virus (HIV), may be considered.

Drug Interactions

Effects of Other Drugs on VIAGRA

***In vitro* studies:** Sildenafil metabolism is principally mediated by the cytochrome P450 (CYP) isoforms 3A4 (major route) and 2C9 (minor route). Therefore, inhibitors of these isoenzymes may reduce sildenafil clearance.

***In vivo* studies:** Cimetidine (800 mg), a non-specific CYP inhibitor, caused a 56% increase in plasma sildenafil concentrations when co-administered with VIAGRA (50 mg) to healthy volunteers.

When a single 100 mg dose of VIAGRA was administered with erythromycin, a specific CYP3A4 inhibitor, at steady state (500 mg bid for 5 days), there was a 182% increase in sildenafil systemic exposure (AUC). Stronger CYP3A4 inhibitors such as ketoconazole, itraconazole or mibefradil would be expected to have still greater effects, and population data from patients in clinical trials did indicate a reduction in sildenafil clearance when it was co-administered with CYP3A4 inhibitors (such as ketoconazole, erythromycin, or cimetidine). It can be expected that concomitant administration of CYP3A4 inducers, such as rifampin, will decrease plasma levels of sildenafil.

Single doses of antacid (magnesium hydroxide/aluminum hydroxide) did not affect the bioavailability of VIAGRA.

Pharmacokinetic data from patients in clinical trials showed no effect on sildenafil pharmacokinetics of CYP2C9 inhibitors (such as tolbutamide, warfarin), CYP2D6 inhibitors (such as selective serotonin reuptake inhibitors, tricyclic antidepressants), thiazide and related diuretics, ACE inhibitors, and calcium channel blockers. The AUC of the active metabolite, N-desmethyl sildenafil, was increased 62% by loop and potassium-sparing diuretics and 102% by non-specific beta-blockers. These effects on the metabolite are not expected to be of clinical consequence.

Effects of VIAGRA on Other Drugs

***In vitro* studies:** Sildenafil is a weak inhibitor of the cytochrome P450 isoforms 1A2, 2C9, 2C19, 2D6, 2E1 and 3A4 (IC50 >150 μM). Given sildenafil peak plasma concentrations of approximately 1 μM after recommended doses, it is unlikely that VIAGRA will alter the clearance of substrates of these isoenzymes.

***In vivo* studies:** No significant interactions were shown with tolbutamide (250 mg) or warfarin (40 mg), both of which are metabolized by CYP2C9.

VIAGRA (50 mg) did not potentiate the increase in bleeding time caused by aspirin (150 mg).

VIAGRA (50 mg) did not potentiate the hypotensive effect of alcohol in healthy volunteers with mean maximum blood alcohol levels of 0.08%.

No interaction was seen when VIAGRA (100 mg) was co-administered with amlodipine in hypertensive patients. The mean additional reduction on supine blood pressure (systolic, 8 mmHg; diastolic, 7 mmHg) was of a similar magnitude to that seen when VIAGRA was administered alone to healthy volunteers (see CLINICAL PHARMACOLOGY).

Analysis of the safety database showed no difference in the side effect profile in patients taking VIAGRA with and without anti-hypertensive medication.

Carcinogenesis, Mutagenesis, Impairment of Fertility

Sildenafil was not carcinogenic when administered to rats for 24 months at a dose resulting in total systemic drug exposure (AUCs) for unbound sildenafil and its major metabolite of 29- and 42-times, for male and female rats, respectively, the exposures observed in human males given the Maximum Recommended Human Dose (MRHD) of 100 mg. Sildenafil was not carcinogenic when administered to mice for 18-21 months at dosages up to the Maximum Tolerated Dose (MTD) of 10 mg/kg/day, approximately 0.6 times the MRHD on a mg/m² basis.

Sildenafil was negative in *in vitro* bacterial and Chinese hamster ovary cell assays to detect mutagenicity, and *in vitro* human lymphocytes and *in vivo* mouse micronucleus assays to detect clastogenicity.

There was no impairment of fertility in rats given sildenafil up to 60 mg/kg/day for 36 days to females and 102 days to males, a dose producing an AUC value of more than 25 times the human male AUC.

There was no effect on sperm motility or morphology after single 100 mg oral doses of VIAGRA in healthy volunteers.

Pregnancy, Nursing Mothers and Pediatric Use

VIAGRA is not indicated for use in newborns, children, or women.

Pregnancy Category B. No evidence of teratogenicity, embryotoxicity or fetotoxicity was observed in rats and rabbits which received up to 200 mg/kg/day during organogenesis. These doses represent, respectively, about 20 and 40 times the MRHD on a mg/m² basis in a 50 kg subject. In the rat pre- and postnatal development study, the no observed adverse effect dose was 30 mg/kg/day given for 36 days. In non-pregnant rats the AUC at this dose was about 20 times human AUC. There are no adequate and well-controlled studies of sildenafil in pregnant women.

ADVERSE REACTIONS

VIAGRA was administered to over 3700 patients (aged 19-87 years) during clinical trials worldwide. Over 550 patients were treated for longer than one year.

In placebo-controlled clinical studies, the discontinuation rate due to adverse events for VIAGRA (2.5%) was not significantly different from placebo (2.3%). The adverse events were generally transient and mild to moderate in nature.

In trials of all designs, adverse events reported by patients receiving VIAGRA were generally similar. In fixed-dose studies, the incidence of some adverse events increased with dose. The nature of the adverse events in flexible-dose studies, which more closely reflect the recommended dosage regimen, was similar to that for fixed-dose studies.

When VIAGRA was taken as recommended (on an as-needed basis) in flexible-dose, placebo-controlled clinical trials the following adverse events were reported:

TABLE 1. ADVERSE EVENTS REPORTED BY ≥2% OF PATIENTS TREATED WITH VIAGRA AND MORE FREQUENT ON DRUG THAN PLACEBO IN PRN FLEXIBLE-DOSE PHASE II/III STUDIES

Adverse Event	Percentage of Patients Reporting Event	
	VIAGRA N=734	PLACEBO N=725
Headache	16%	4%
Flushing	10%	1%
Dyspepsia	7%	2%
Nasal Congestion	4%	2%
Urinary Tract Infection	3%	2%
Abnormal Vision[1]	3%	0%
Diarrhea	3%	1%
Dizziness	2%	1%
Rash	2%	1%

[1]Abnormal Vision: Mild and transient, predominantly color tinge to vision, but also increased sensitivity to light or blurred vision. In these studies, only one patient discontinued due to abnormal vision.

Other adverse reactions occurred at a rate of >2%,but equally common on placebo: respiratory tract infection, back pain, flu syndrome, and arthralgia.

In fixed-dose studies, dyspepsia (17%) and abnormal vision (11%) were more common at 100 mg than at lower doses. At doses above the recommended dose range, adverse events were similar to those detailed above but generally were reported more frequently.

No cases of priapism were reported.

The following events occurred in < 2% of patients in controlled clinical trials; a causal relationship to VIAGRA is uncertain. Reported events include those with a plausible relation to drug use; omitted are minor events and reports too imprecise to be meaningful:

Body as a whole: face edema, photosensitivity reaction, shock, asthenia, pain, chills, accidental fall, abdominal pain, allergic reaction, chest pain, accidental injury.

Cardiovascular: angina pectoris, AV block, migraine, syncope, tachycardia, palpitation, hypotension, postural hypotension, myocardial ischemia, cerebral thrombosis, cardiac arrest, heart failure, abnormal electrocardiogram, cardiomyopathy.

Digestive: vomiting, glossitis, colitis, dysphagia, gastritis, gastroenteritis, esophagitis, stomatitis, dry mouth, liver function tests abnormal, rectal hemorrhage, gingivitis.

Hemic and Lymphatic: anemia and leukopenia.

Metabolic and Nutritional: thirst, edema, gout, unstable diabetes, hyperglycemia, peripheral edema, hyperuricemia, hypoglycemic reaction, hypernatremia.

Musculoskeletal: arthritis, arthrosis, myalgia, tendon rupture, tenosynovitis, bone pain, myasthenia, synovitis.

Nervous: ataxia, hypertonia, neuralgia, neuropathy, paresthesia, tremor, vertigo, depression, insomnia, somnolence, abnormal dreams, reflexes decreased, hypesthesia.

Respiratory: asthma, dyspnea, laryngitis, pharyngitis, sinusitis, bronchitis, sputum increased, cough increased.

Skin and appendages: urticaria, herpes simplex, pruritus, sweating, skin ulcer, contact dermatitis, exfoliative dermatitis.

Special senses: mydriasis, conjunctivitis, photophobia, tinnitus, eye pain, deafness, ear pain, eye hemorrhage, cataract, dry eyes.

Urogenital: cystitis, nocturia, urinary frequency, breast enlargement, urinary incontinence, abnormal ejaculation, genital edema and anorgasmia.

OVERDOSAGE

In studies with healthy volunteers of single doses up to 800 mg, adverse events were similar to those seen at lower doses but incidence rates were increased.

In cases of overdose, standard supportive measures should be adopted as required. Renal dialysis is not expected to accelerate clearance as sildenafil is highly bound to plasma proteins and it is not eliminated in the urine.

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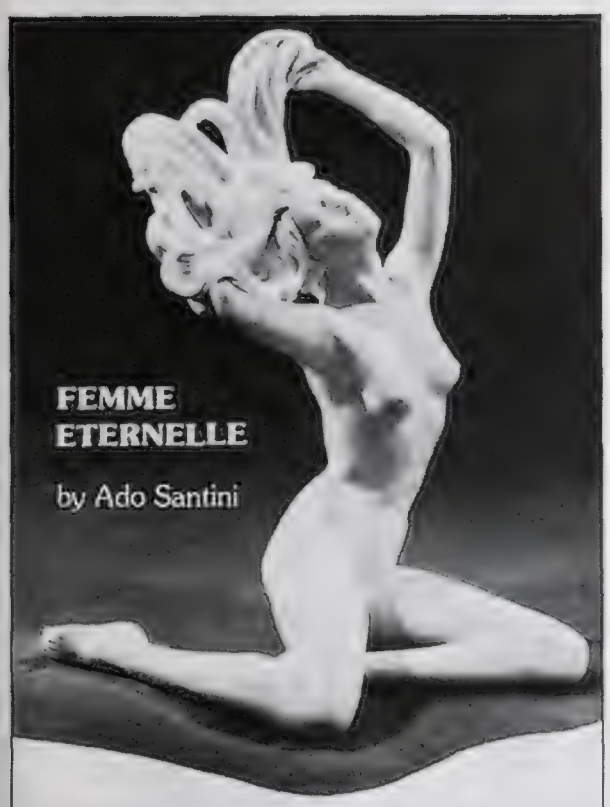
Before sailing to Georgia, Oglethorpe had enlisted a small band of Italian silkmakers. They arrived in Savannah in a cantankerous mood that did not improve upon exposure to the New World. When the trust proved slow in paying its bills, the chief silkmaker, Paul Amatis, went on strike. Other crises followed. Amatis was a hothead who often quarreled with his townsmen, and he strained official patience by taking "a scandalous wench to himself instead of a wife."

After Amatis died in 1736, the silk business passed to one Mary Camuse.

Oglethorpe refused to budge. Slavery, he thought, "would occasion the Misery of thousands in Africa."

Known for an "exceeding fine hand" at winding silk, she also had an exceeding fine appreciation of her indispensability. *Midnight in the Garden of Good and Evil* features a lovable con artist, Joe Odom, a piano-playing lawyer who bounced checks, blithely moved into a house when its owners were out of town, and avoided utility bills by splicing a wire to a neighbor's electrical line. Mary Camuse had all of Odom's brass but none of his charm. With exquisite timing, she demanded one large favor after another—a few cattle here, a plot of land there—and routinely got what she wanted because it was understood that she could wreck an entire year's silkworm production simply by staying her fine hand.

In her native Piedmont, teaching a foreigner to make silk was reportedly a crime punishable by death, and for years Mrs. Camuse used this as a pretext for refusing to take any apprentices. Finally persuaded to teach two young girls, she gave them busywork



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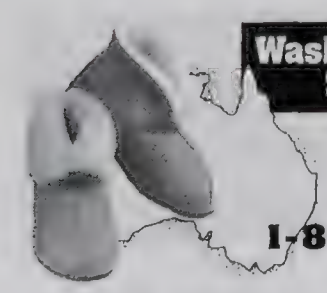

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for several months and then sent them home. The girls thought they had seen enough to be able to wind silk on their own if a carpenter could make a copy of the tools, but Mrs. Camuse would not let the tools be seen. With equipment and instruction manuals ordered from London, the girls eventually began making silk. When they saw that it did not measure up to Mrs. Camuse's, they sought her advice—in vain.

Mrs. Camuse was not the only loose thread in the British Empire's Georgia silk plan. Mulberry leaves, vulnerable to spring frosts and haphazard horticulture, were often scarce. Even a small silk operation involves thousands of worms, each of which, in its short lifetime, can devour 24,000 times its weight in leaves. Fussy eaters, the worms insist on dining every six hours and demand their leaves dry and finely chopped, a task that must have seemed endless in the age before Cuisinarts.

Mary Camuse died in 1749. Silk flourished briefly under the tutelage of others and with financial incentives from Parliament, but as England grew more displeased with its American colonies, the subsidies, and the silk business, evanesced. By the time the last reels of raw silk left Savannah in 1790, cotton had become the stuff of Georgia's dreams.

Cotton and Savannah go together like mint and julep. The first cotton grown in Georgia was cultivated in Savannah's public garden; and in Georgia, as elsewhere in the South, King Cotton owed his reign to slavery, an institution Oglethorpe had opposed but ultimately could not prevent. As every Savannahian could see, nothing could be finer than to be in Carolina, just across the river. There a man could drink what he chose, buy as much land as he could afford, do with it as he pleased and own slaves. Slaves not only spared their masters the hardest physical labors; they saved enormous sums in wages. Depending

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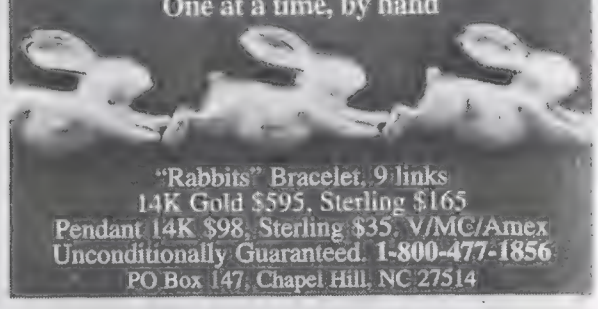

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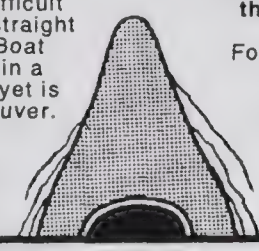

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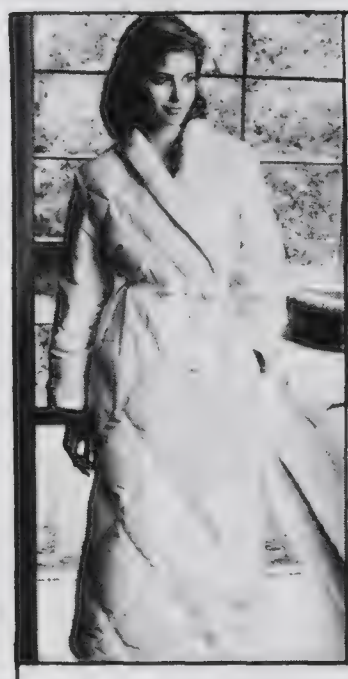

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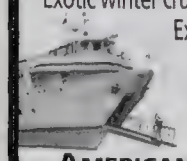

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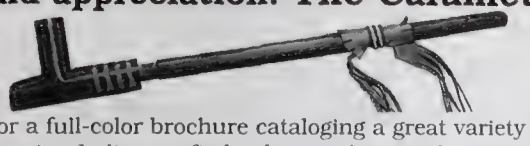

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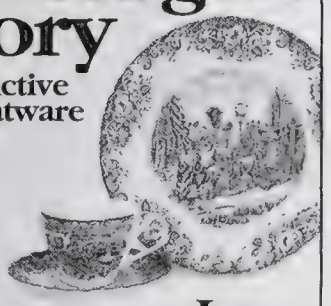

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on who did the ciphering, white servants were anywhere from two to six times more expensive than slaves.

In 1735, a Savannah physician by the name of Patrick Tailfer and others also tried to tilt the trustees toward slavery, using medical and economic arguments. The heat was unhealthy for Englishmen but natural for Africans, they claimed. When white servants' indentures expired, an employer faced two unpalatable choices: a long, costly voyage to Britain to recruit new servants or hiring the "harden'd abandoned Wretches" shipped to Georgia by the trust. The wretches often ran away, blending easily among other whites, "whereas Negroes would always be known and taken into Custody." And because slave labor was so much cheaper, "our neighbors in Carolina would always undersell us."

While the trustees campaigned for increased parliamentary appropriations to offset a steady decline in private donations, private investors insisted that they would put up the necessary funds if they were permitted to own slaves and large, unencumbered properties. The last bar to slavery fell in 1743, when the frustrated Oglethorpe, needing to replenish his exchequer, returned permanently to England.

With Father out of the way, only one question about slavery remained: When? In the public houses of Savannah, would-be slaveholders hoisted their tankards and proposed toasts to "the one thing needful." Betting that the one thing soon would be secured, private adventurers began pouring money into Georgia. Between 1743 and 1749, the annual influx of private capital swelled from a previous average of £2,460 to £16,320. By 1748, slaves were hard at work in Georgia.

The colony flourished. Oglethorpe's Savannah disappeared. The Savannah that emerged, so exquisite that even Gen. William Tecumseh Sherman could not bring himself to burn it

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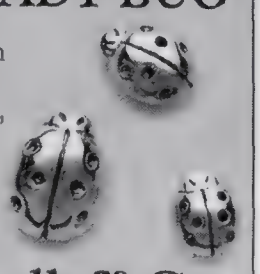

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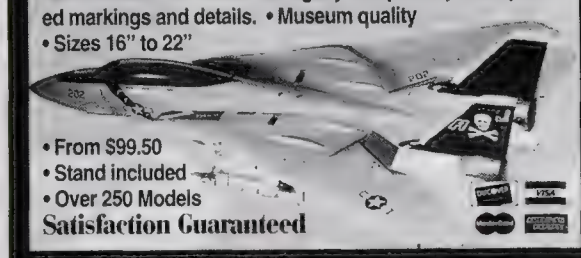

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down on his pyromaniacal Civil War march to the sea, was a product of high noon in the garden of evil. Tour guides seldom mention it, but many of the city's antebellum buildings were constructed with the labor of slaves, and most were paid for with profits from cotton, which is to say, from the labor of slaves.

Oglethorpe left Savannah for England for the last time on July 22, 1743. A year later, in September, he married heiress Elizabeth Wright, who brought him a much-needed fortune. Forty-six when he left Georgia, Oglethorpe lived to be 88. During his decade in Savannah, he had advanced £90,000 of his own money to keep the colony afloat. Parliament finished paying it back in 1792, seven years after his death.

Oglethorpe's inability to turn Georgia into paradise has been hard on his reputation. The failure is often blamed on his high-handedness, and it is true that he preferred government by edict to the democratic brawling of consensus, compromise and negotiation. It is also true that "Not for self, but for others" was a creed easier on well-heeled gentlemen than on starving farmers. Still, the fact that dawn in the garden of good and evil ended with the defeat of good says more about the power of greed than about any weaknesses of James Oglethorpe's. And—delectable irony—by taking a hard line, Oglethorpe turns out to be the quintessential Savannahian. "For me," John Berendt writes in the last paragraph of *Midnight,* "Savannah's resistance to change was its saving grace. The city looked inward, sealed off from the noises and distractions of the world at large." The resistance and the inwardness started with Oglethorpe. Had they taken root in his garden as he hoped—well, that would be another story.

This story is adapted from Patricia O'Toole's new book, Money and Morals in America.

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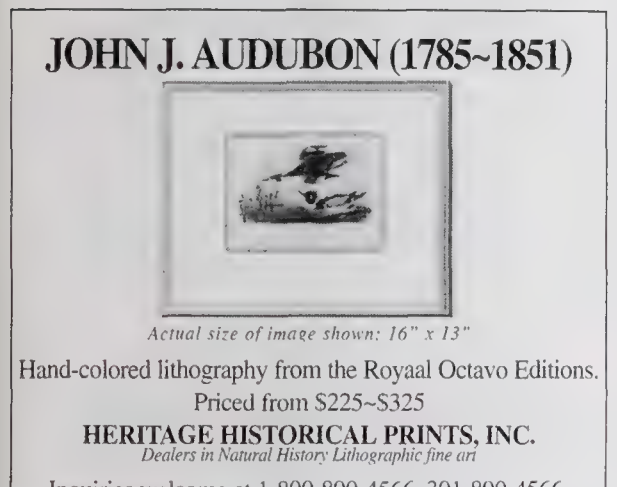
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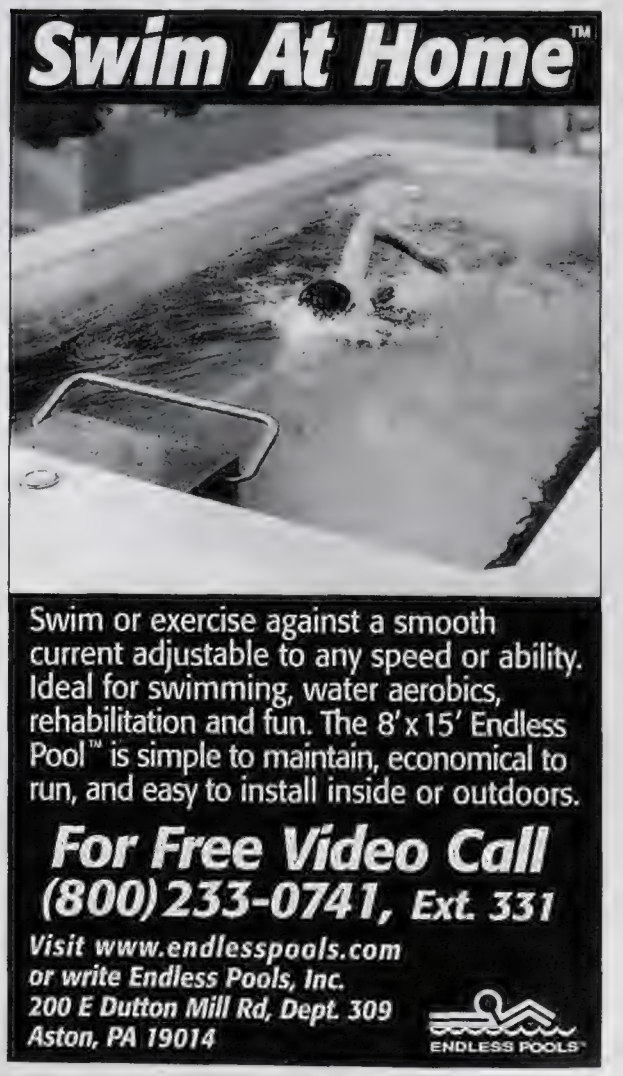
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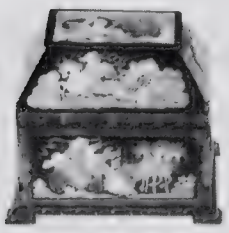

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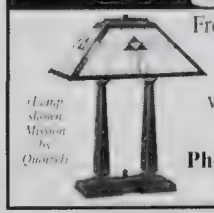

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THE LAST PAGE

Conversation Stoppers

BY GERALD DUMAS

WHEN I FIRST MET MY WIFE, GAIL, on a football weekend at the University of Arizona, she was 17. She had huge brown eyes and high cheekbones. Just another beautiful, intelligent, high-principled college girl, but I thought I could live with that.

Unlike me, she was no blabbermouth. After a few dates, we parked one afternoon outside Tucson and watched the lights come on while I spoke of all my hopes and dreams. When I paused for breath, she took my hand and said earnestly, "I don't want to see you anymore."

That was 40 happy years ago, during which time Gail's conversation stoppers have never been in short supply. Without trying to, she usually gets the last word, and without meaning to, I usually end up playing George Burns to her Gracie Allen.

Without trying to, she usually gets the last word, and I usually end up playing George Burns to her Gracie Allen.

Several years ago we were watching an old movie on TV. Gail pointed to the leading man and said, "Who's that?"

"Cornel Wilde," I said.

"Didn't he die?"

"No, not yet."

"Who died?" she asked.

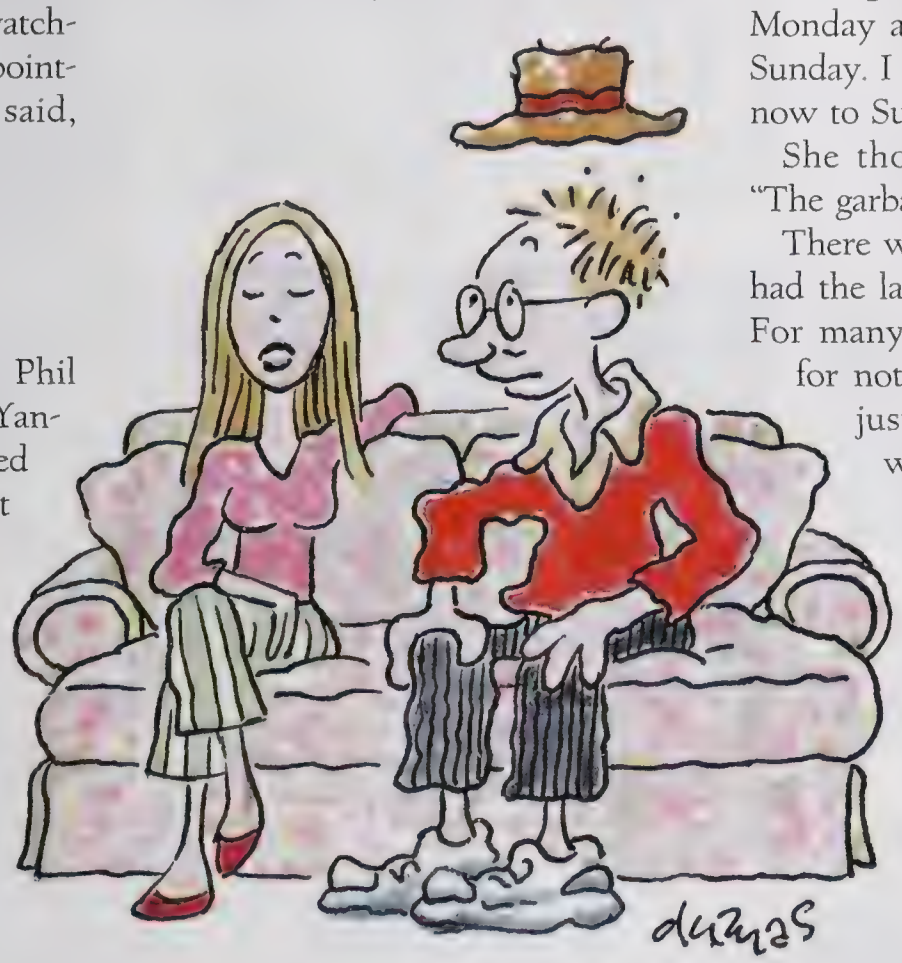
A few summers back, when Phil Rizzuto was still a New York Yankees broadcaster, she and I agreed that listening to him was the best part of the games.

"He's terrific," I enthused. "It doesn't make any difference what he's going on about, bowling, cooking, movies or whatever. I can listen to him talk all night." We continued watching the game for a minute, then I added, "But you don't seem to like it when I talk all night."

She smiled. "I can turn *him* off, can't I?"

Another evening we were listening to a violin concerto when she said: "Is it Pinchas Zukerman I always think is Itzhak Perlman, or the other one?"

When I returned from a trip to a local store recently, I mentioned that something I'd bought had cost only six dollars. "Only," said Gail. "If I had a pocketful of your 'onlys' I could go to France."



We did go to Italy. When we arrived at our hotel, the manager complained that we were late. "Do we have a room or not?" asked Gail.

He drew himself up. "I have given your room away," he said.

He stared at her imperiously. She stared back at him. At length he seemed to wilt. "Yes, I have given your room away," he said. "But it so happens I have another."

One spring day as I drove her to the airport I announced, "When I get home I'm going to mow the lawn." She didn't say anything, so I rattled on. "I've always been a little worried that someday the tractor might overturn on that steep bank near the pool and pin me underneath. The neighbors are on vacation, this is Monday and you won't be back till Sunday. I could lie pinned there from now to Sunday."

She thought a minute and said, "The garbageman comes on Friday."

There was a time when I figured I had the last word, but I was wrong. For many years I've been criticized for not listening. "I told you that just yesterday," Gail will say with a weary toss of her head. At last one morning she asked me a question and I knew I had her.

"Ha!" I said. "I told you that yesterday! I said it to you twice!"

"You've never said anything just twice," she replied with a weary toss of her head.

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I wish my older cat *was more playful.*

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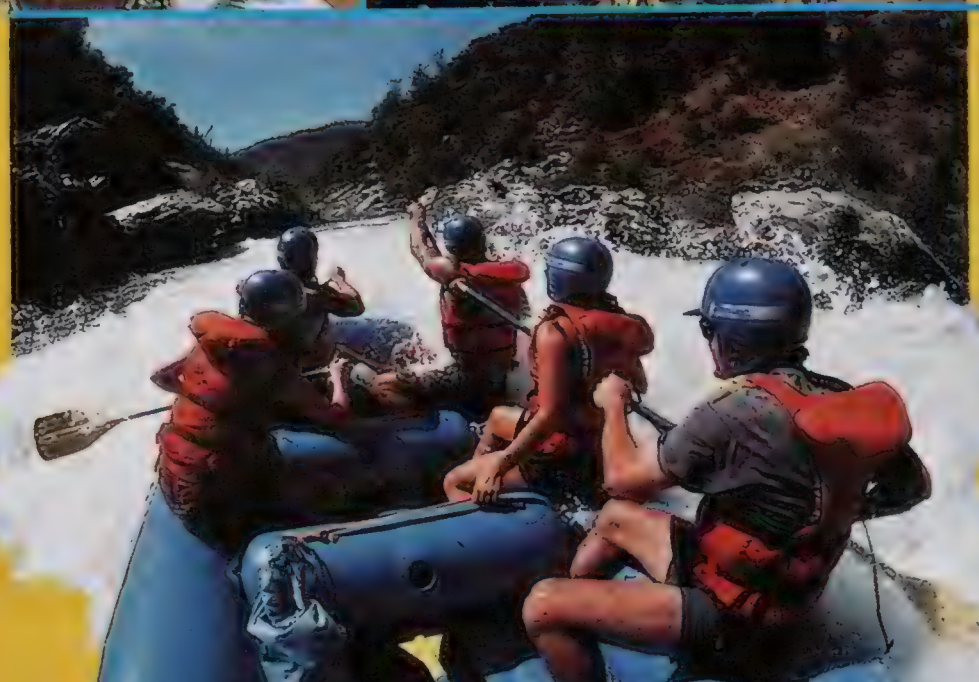

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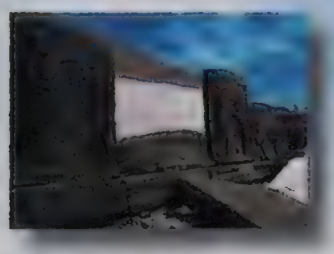

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Today, travelers of all skill levels are enjoying river rafting — sometimes in the unlikeliest locales.

The New Explorers

BY MARK GAUTHIER

The ruins of the Celsus Library in Turkey are a rich cultural offering for countless visitors.

EMBRACING ACTIVITY-BASED ADVENTURE

One of the by-products of the continuing boom in adventure travel is that few people travel "just to go somewhere" anymore. Travel these days isn't just "active," it's "activity-based," with trips built around the things that active people love to do.

From river-rafting to rain-forest trekking to running marathons, travel now is as much about "what we're doing" as "where we're going," with the itinerary of activities as much a priority as the destination itself.

To get a "read" on current activity-based adventure travel, we spoke with a selection of ASTA representatives nationwide.

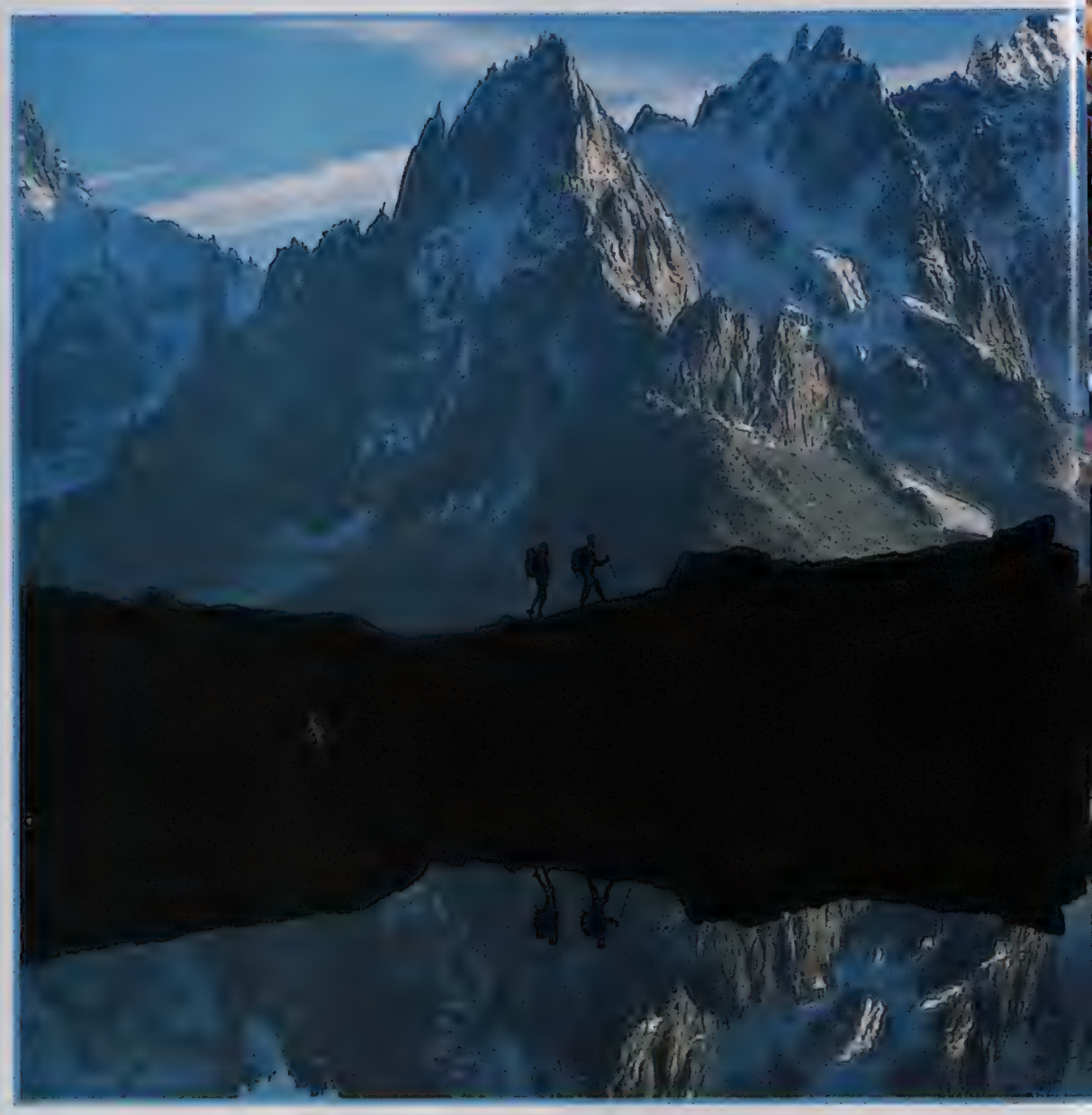
INTERACTING WITH A CULTURE

"I think humans have within them a desire to *explore*, to seek out adventure," says Karen Johnson of Preferred Adventures Ltd. in St. Paul, Minnesota. Far-off destinations have always appealed to the 55-year-old business owner, who began flying lessons at age 17, has been to all seven continents, and can't wait for the day when adventure travel means space exploration and deep-water excursions in submersible vehicles. Until then, what activities does she view as seminal for today's adventurers?

> **"Adventure travel now is as much about 'what we're doing' as 'where we're going.'"**

"All I know is that *trekking* is something that more and more people simply want to do," she says. "The most dramatic trek that I know is the Trans-Darien Trek along the Colombia/Panama

Whether in the Alps, the Rockies, or the Himalayas, mountain climbing and hiking experiences can range from serene to invigorating.



border, which retraces the steps of Balboa from the Caribbean to the Pacific. It's an exciting voyage through pristine rain forests and remote countryside; we're talking about a serious two-week outing with maps, Indian guides and porters, two days between villages — it's almost a survival exercise, and it's incredibly exhilarating."

Explorers to Panama are flocking not just to native villages, but to the exciting recent discovery of the archaeological ruins of "Old Panama," the first colonial city established on the Pacific coast by the Spanish Crown in 1519. In Portobello, near Colon on the Atlantic side, the "Camino de Cruces" was used by the Spanish to transport gold; it winds past virgin beaches and pirate hiding places of centuries gone by, combining breathtaking scenery with history.

But is there a difference between adventure travel today and, say, ten years ago?

Says Karen Johnson, "Mass tourism used to be, 'Put me on a bus and show me some cathedrals and museums.' There's still some of that, but now it's more likely that someone will say, 'I want to *interact* with a culture, I want to learn a language, I want a home-stay and not a hotel.'

"People have their interests, and they like to pursue them on vacation," Johnson continues. "But as certain activities get more commonplace and widespread — skiing, for example, which has become a mainstream sport in America — other, more exotic, activities take their places, activities that people feel will help them 'stretch' themselves."

"People are passionate about what they like to do. And if they can build a trip around something they love, then that, by definition, is an adventure."

Notable here is the continuing rise of "culture-based" travel, even to destinations that are traditionally purely "recreational" in nature. In the U.S. Virgin Islands, for example, travelers to St. Croix are as likely to explore the Danish heritage and history of the island's two historic towns — Christiansted and Frederiksted — or take in the color and diversity of the Caribbean Dance Company, as they are to head to the sun and surf of St. Croix's beaches. Of course, bird-lovers, as well as devotees of the incredible "sea gardens" and aquatic wildlife that thrive in protected reefs, can have a field day in the U.S. Virgin Islands too!

RUNNING, RIVER-RAFTING, AND SEA-KAYAKING

"People are passionate about what they like to do. And if they can build a vacation trip around something they love, then that — by definition — is an adventure." So says Jeff Kane of Tucson's Arizona Travel Center.

"My biggest example of this is *running*. Our company promotes a number of trips to marathons in cities around the world. And our clients aren't going just to watch — they're going to *participate*. For people who are into running, a trip to the Boston marathon, say — or the equivalent race in London or New York — is an exhilarating experience. And that's what people are after. Running vacations are a perfect example of

"Bhil" Tribals participate in a "Bhagoriya" festival

"Big cat" in
Kanha National Park

Rice boat on Vembanad Lake, Kerala

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an activity driving the trip. And frequently these amateur athletes are as interested in enjoying the cultural aspects of a particular city's marathon as in the race itself."

What else is hot?

"Diving remains incredibly popular," Kane advises. "It's skyrocketing, still. I have a theory that, as the baby-boomer generation ages, scuba diving will get more and more popular. It's adventurous and exotic but it's a *gentle* activity — it's demanding, but not as rough-and-tumble as downhill skiing can be."

Ship-and-shore packages can go way beyond the concept of the traditional "floating hotel."

Photos: World Explorer Cruises

The familiar becomes exotic when viewed up close by boat, canoe or sea kayak. Here, a moose forages close to shore.

Kane says many of his diving clients favor Mexico's Baja California, because of its beauty and because it's relatively unspoiled by commercial tourism. Kane is also sending lots of his Arizona-based travelers to Costa Rica.

"River rafting, sea-kayaking, and rain-forest exploration are the big activities in Costa Rica, which remains extremely popular. Trekkers find the jungles phenomenal, and sea-kayakers with an interest in wildlife can watch as sea turtles swim right up to the kayak. The closeness to nature there is incredible."

What's next, in Kane's view?

"I think you're going to see the travel industry working harder to come up with different experiences in activity-based travel. The Internet is a great tool for consumers because it gives them ideas for things to do, and motivation. And of course the world economic and political situations have a lot to do with the destinations people will be choosing. But the demand for the exotic will definitely remain high."

For some, that means a destination as far off as India: the near-religious experience of standing in the dawn light marveling at the pink-white marble of Agra's Taj Mahal; the spooky rock-cut caves of Ajanta and Ellora, in Aurangabad; the legendary tigers of Kanha National Park; and the unimaginably high peaks of the Himalayas in Himachal Pradesh and Uttar Pradesh.

For others, "the exotic" can be as close as Puerto Rico: dropping anchor at a waterfront marina in San Juan for a week of salsa lessons; marveling at the restoration of 15th- and 16th-century historic sites in Old San Juan and Ponce; or expeditions to the rain forest center in El Yunque, which hosts over one million trekkers who traverse its stunning trails yearly.

FAR-FLUNG SAFARIS

The "demand for the exotic," as Jeff Kane puts it, is nothing new to Gretchen Stark of Safari Outfitters, Inc. of Cody, Wyoming. Safari Outfitters opened Mongolia to sport-hunting over 30 years ago, and since 1952 has pioneered hunting and fishing opportunities throughout the world, principally in Asia and Africa.

"One of the greatest rewards in our business is having the chance to visit fascinating cultures in some of the most remote parts of the world," says Stark, who last year obtained military clearance to go into the Pamir Mountains bordering Afghanistan, Pakistan, and Tajikistan "to retrace the steps of Marco Polo and traverse portions of the original Silk Road." Stark's mission there was about opening up new hunting programs in China — to add to the long list of safari expeditions she conducts to such destinations as Russia's Kamchatka Peninsula (for Kamchatka Bighorn Sheep), Siberia (stalking the Siberian Ibex), Mongolia (after Mongolian Elk), and Zimbabwe (where trophy game includes elephants, lions, buffalo, and leopard).

Stark is careful to stress that Safari Outfitters is committed to worldwide conservation activities. As an example, she explains that the money generated through hunting permits in Tajikistan pays

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My Photo

The Colorado River, from a guide's point of view. I call it "The River Rats Who Drank Rapids."

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"We've had such success in recent decades in wildlife preservation," Stark says, "and so many good protective programs have been set up for endangered species that many species today exist in greater quantity than ever before. Hunting truly is becoming more popular than ever." And, of course, for adventurers more interested in hunting *scenery* than game, a camera safari — outfitted with the latest in advanced, lightweight picture-taking gear — is the obvious alternative.

MEANWHILE, CLOSER TO HOME...

"Biking and walking are the two most popular 'soft adventure' activities these days," states Karen Killebrew of Escape Artists Travel & Holtz Tours in Oakland, California. "Especially among couples, European bicycling trips and walking tours are absolutely 'off the charts' in terms of popularity. It's strange, in a way, because Europe is expensive now — and yet our trips are sold out.

"Maybe the somewhat shaky economic situation in Asia has something to do with Europe's popularity. We're also organizing a lot of *cultural* tours to Europe — custom-itineraries based on an interest in art, concerts, even a week of theater.

"What I also see," Killebrew observes, "is more *focus*. Travelers are better informed now; they know what they want from a trip. Diving and snorkeling remain very big. And there's a definite focus on family vacations."

What does Killebrew see on the ecotourism front?

"The good news in ecotourism comes on two fronts. First, interest in environmentally educational adventures remains high, which is good not only for the travel industry but for the planet. And second, I notice less and less 'greenwashing,' tour operators *pretending* to be ecotourism experts just to jump on the environmental bandwagon. The legitimate ecotourism companies are getting stronger and better established."

It's difficult to talk ecotourism without mentioning the popularity of Costa Rica, whose rain forests always rank among the top destinations for tropical trekkers. Costa Rica has 12 ecosystem zones, ranging from tidal mangrove swamps to sub-alpine *paramo*, with stunted dwarf plants above the timberline. It's a natural environment that surprises even jaded adventure-trekkers in its diversity.

Which isn't to say that indoor pursuits can't be equally adventurous. Countless culturally minded explorers with a bent for *history* find Barbados a can't-miss destination, and go there to tour stately National Trust houses of architectural distinction; see the extensive collection of African and Barbadian artifacts at the Barbados Museum; and get a fascinating glimpse of plantation life at Barbados' sugar estates.

© Carol Lee

© David Swanson

Parasailing and biking are popular and exhilarating activities for adventurers visiting the U.S. Virgin Islands.

EUROPE AND THE ALPS

Joan Poulnot of the Summerville, South Carolina-based company Adventure Travel, Inc., says that, in her experience, in the case of both biking and hiking trips, the activity comes ahead of the destination — "as long as the destination is someplace beautiful!"

For Poulnot's clients, the Swiss Alps are a number-one hiking destination, with a favorite biking tour taking cyclists through the Alps' spectacular Brenner Pass. France and Great Britain remain top destinations for bicycle adventures overall, while undiscovered parts of remote Scotland are becoming ever more popular with hikers. When it comes to animal encounters, African photo safaris are favorites, Poulnot says, while, for marine adventurers, nothing can beat an expedition to the Galapagos Islands for variety, grandeur and natural wonder.

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On the cultural side, Poulnot sends archaeology and ancient history buffs to Turkey — describing the country as "packed with history" and "considerably more friendly to Americans and less bureaucratic than Greece."

In Turkey, visits to Ephesus — once a commercial center of the ancient world — and Istanbul are unforgettable cultural adventures; and the 6,000-year-old hollowed-out rock dwellings of Turkey's Goreme National Park — known in Roman times as Cappadocia — are truly one of the architectural wonders of the world. Wildlife lovers can luxuriate in Turkey's internationally known Kuscenneti National Park, home to over 239 species of birds, while backpacking and

© Steve Simonsen

Salvage diving expeditions in clear tropical waters combine sport, history, culture, and photography.

camping enthusiasts will want to tackle Mount Erciyes, one of Turkey's most important mountaineering and winter sports centers — and Anatolia's tallest volcano!

And what about desert adventures?

"For the desert, you simply can't do better than the American Southwest," says Joan Poulnot.

Diving?

"We've been sending divers principally to the Cayman Islands for years, and the Caymans are only increasing in popularity." Notably, Poulnot observes a definite upswing in the number of *women* attracted to scuba diving — with growing groups of women divers joining the ranks of women horseback riders, women hikers, and women golfers who "aren't dependent on a husband or significant other for their travel adventures."

OFF THE CRUISE SHIP, ONTO A BIKE

"Travel is definitely getting more activity-focused; that's one of the major reasons behind the success of places like the Disney Institute, in my view." So says Dan Lanser of A+ Travel Adventures in Uniontown, Ohio, referring to the Orlando-based facility that offers theme-based holidays around everything from television and film production to the culinary arts and tennis.

Lanser makes the important observation that the focusing of adventure travel around specific *interests* has resulted in the growth of tour operators geared not only to activities but to demographic segments of the population.

"We do a lot of adventure travel for the 18-to-35 group," Lanser says, "and we work with groups like Kon Tiki Holidays, that specialize in younger travel. On the other hand, we also work with companies like ElderTreks, that specialize in work with older groups. And still other companies, like Backroads, handle a wide variety of groups.

"What I'm noticing," Lanser continues, "is that a lot of travelers are working newer activities into more traditional vacations. For example, there are Alaska cruises now in which, as part of the cruise, you're met in Juneau by a mountain-bike tour operator with a truck full of mountain bikes. The cruise passengers disembark and then hit the road on their mountain bikes for a 15-mile ride on the glacier. This kind of thing is a great way to have both a relaxing holiday *and* an active adventure outing, in one trip."

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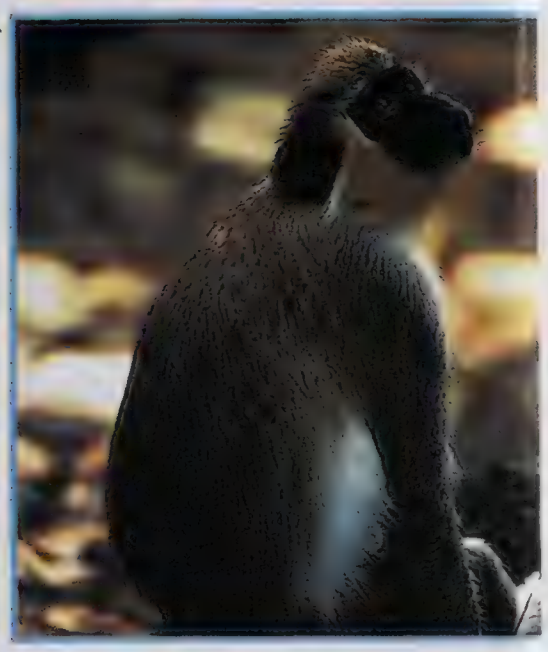

Barbados Tourism Authority

Conservation efforts around the world have not only saved species like the Bengal tiger of India from extinction *(top)* but also provide explorers with beautiful parks such as the Barbados Wildlife Reserve *(bottom)*.

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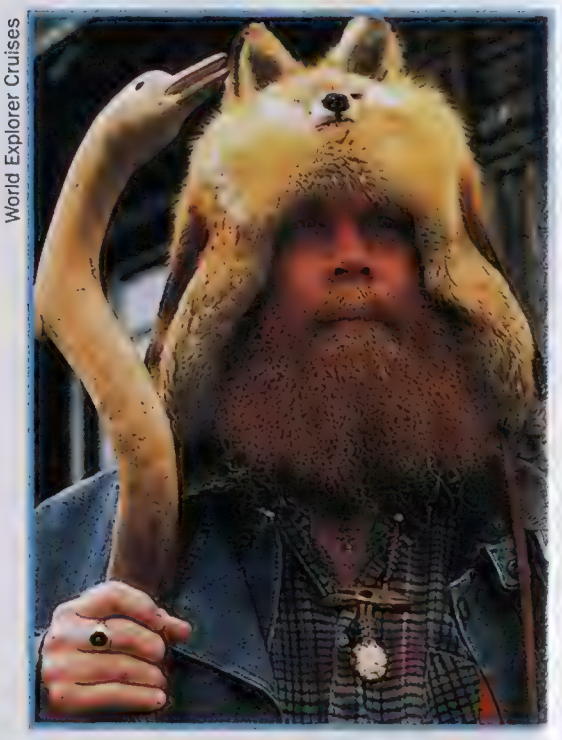

World Explorer Cruises

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ery and learning, complete with onboard experts in geology, biology, history, and anthropology. You can cruise aboard vessels that make stops not just to go biking, but to visit native cultures, go kayaking, view wildlife by helicopter ("flightseeing"), even pan for gold.

Where does Lanser stand on the question of what's more important in travel-planning — destination or activity?

"Well," he answers, "ski trips are a good example of that choice. If someone comes into our agency and wants to ski, but also wants, say, a European cultural experience, we can send them to Austria, Switzerland, France. If it's a family experience they're after, we'll recommend a spot like Steamboat Springs, Colorado. Lake Tahoe is popular with people who want a wide *variety* of attractions, not just skiing; Aspen and Vail are for the purists; while Utah can often be the most dependable in terms of snow. So with one activity, you have a really wide variety of choices of destination."

IT'S ALL ABOUT EXCITEMENT LEVEL

Amazon river cruises. Treks in the lake districts of Chile and Argentina. Diving in Micronesia. These are a few of the trips Marjorie Hollinrake of Zuma Travel in Malibu, California has in mind for her adventurous clients.

"Half the time the activity drives the trip, and the other half it's the destination," Hollinrake estimates. "But either way I definitely notice an increase in the level of excitement people want. Among divers, for instance, the place to go now seems to be off the coast of Costa Rica, to a place called 'the Wall of Sharks,' where, if you go far enough out, you encounter what is literally a solid wall of hammerheads.

"For archaeology and ancient culture buffs I always suggest Mexico — Cancun, the Yucatan, and even Mexico City. For trekking, Tibet and the Himalayas remain hot. And ecotourists who want to see something other than the rain forest seem to love Ireland these days — not only is the verdant countryside unbelievably stunning ... but you can sleep in a castle!"

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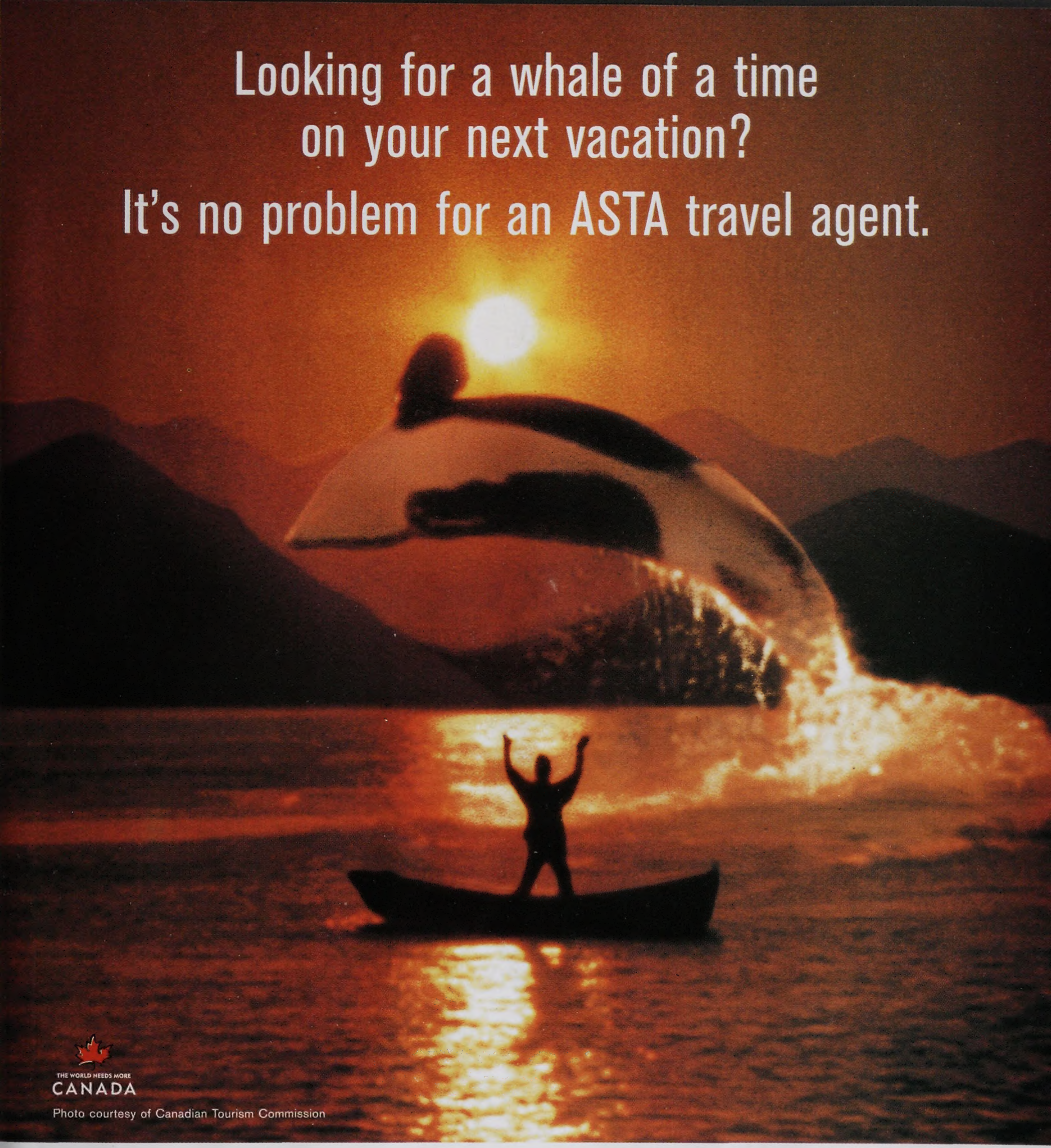
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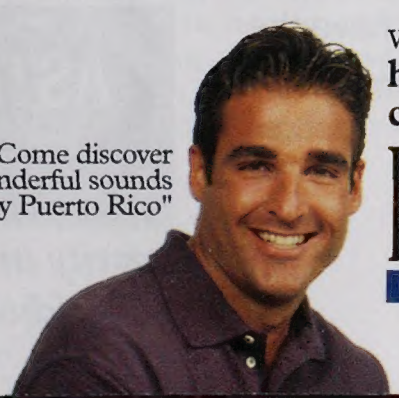

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